

WHY USE RFID

- **Use RFID if you want to wirelessly identify something without *line of sight*.**

Line of sight means that one could draw a straight line going directly from the reader to the object without interruption. This is literally what is done for bar codes via a laser. If the laser can't "see" the object, it won't be read. This is very intuitive to us whenever we go to the supermarket and a bar code reader has the bar code faced toward the scanner beam. RF is much less precise; it's more like a big balloon of energy that encircles the object allowing it to be read on all sides. The cost of this is literally money: printed bar codes are super cheap (usually only the cost of ink or about \$0.005), but RFID usually needs a microchip to change the balloon enough to be read by a reader (usually \$0.07 to \$0.25 or more). This tradeoff is essential for many applications for contactless payments, building access, highway toll access, supply chain management, finding tools in trucks, etc. Rather than us adjusting to our computing devices to orient things, we can augment the computing devices to see in a different way so that our normal human gestures or how objects are placed in space or move in time can be seen easily.

- **Use RFID if you want a simple wireless means to store a small amount of information on things or to change the information dynamically.**

RFID tags usually contain 96-512 bits of information on them, and each tag can be read in less than 5 ms or 5 thousandths of a second. Modern standards allow hundreds or even thousands of tags to be read in an apparently simultaneous fashion. Most tags allow you to dynamically change this ID and other types of user data tens of thousands to hundreds of thousands of times. In short, tags are very versatile.

- **Use RFID if you want a computing device but not humans to see the ID.**

In some applications it is important to be able to physically hide the RFID tag in the object. All barcoded products have a very visible signature on their product marketing. A tag could be embedded in laptop computers unobtrusively to find out their mac address without powering them on; tools in a truck bed can have their identities embedded inside the tool; wallets can reveal a subway pass without even leaving your pocket. One important consideration for choosing passive or battery-assisted passive RFID over active RFID is that active devices need to be certified by the FCC. If you want to embed RFID into a box of cereal, it would be nice not to have to send the box to the FCC. Passive technology gives you this opportunity.

- **Use UHF RFID if you want a computing device to see an object from far away.**

One of the significant benefits of UHF RFID is that tags can be read from far away. Passive UHF allows objects to be read across a room, while battery-assisted-passive and active tags can be read across buildings and in very difficult RF environments.

- **Use UHF RFID if you want to enable the "Internet of Things".**

Why Use RFID

We believe that once RFID interrogators are prevalent (the network exists) and share a common mode of exchanging information, a network effect (or Metcalfe's law) and set of application layers will be created from an ecosystem of identifiable objects. We believe that this will fundamentally change the way we interact with the physical world when every object has a digital identity. For now, these applications will be vertically-oriented or closed-loop reader, tag and software systems, but will grow in value as these applications begin to overlap and share information, just as computers once were before the internet.

ABOUT JADAK:

JADAK, a business unit of Novanta, is a market leader in machine vision, RFID, barcode, printing, and color and light measurement products and services for original equipment manufacturers. The company designs and manufactures embedded detection and analysis solutions that help customers solve unique inspection, tracking, scanning and documenting challenges. The company is ISO 9001 and ISO 13485 registered.

Novanta is a trusted technology partner to OEMs in the medical and advanced industrial technology markets, with deep proprietary expertise in photonics, vision and precision motion technologies.

ThingMagic is JADAK's RFID line of products and services.

www.jadaktech.com

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JADAK
A Novanta Company

USA Office

phone: +1 315.701.0678
email: info@jadaktech.com
web: jadaktech.com

European Office

phone: +31 (0)76.522.5588

Asia Pacific Office

phone: +86 512.6283.7080

