

***15 Reasons  
why  
Passive Tags  
are a better choice  
than Active Tags!***



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# 15 Reasons why Passive Tags are a better choice than Active Tags in comparing RTLS architectures:

1. **Costs** - Passive Tags range from ten cents to ten dollars depending on volume, personalization<sup>1</sup> and enclosure style. Active tags are going to be more than 10-50 times the cost.
2. **Longevity** - The simple design, with no moving parts or batteries to wear out, allows passive tags to last for decades versus active tags which struggle to live past 3 years. Passive tags will last 5 to 100 times longer than active and never require scheduled maintenance.
3. **Batteries not required** – Because the passive tags use energy harvesting, they do not require a power source. With no batteries to change there is no maintenance. Active tags are the exact opposite requiring frequent battery maintenance, firmware updates and management of MAC and IP addresses. A significant workload for your IT department.
4. **Industry Standards** - The International Standards Organization (ISO) 18000-63 standard ensures the passive tags are plug and play across all manufactures. Leading to better pricing and functionality. Hundreds of tag and reader companies conform to this standard. This is the opposite for the Active RFID companies with proprietary tags locking you into their hardware.
5. **Collision and Arbitration for RLA** – Passive RFID excels at large tag populations in close proximity due to its advanced “Q” algorithm and covered coding. Reading up to 1600 tags per second. Whereas active RFID is limited. It has problematic interference between active tags and the required supplemental equipment (IR, sound, Wi-Fi) to guarantee room level accuracy (RLA). Since active was not designed to read thousands of tags a second it fails in dense tag environments like inventory in a distribution center.
6. **Largest Install base** - Passive RFID leads the tracking space with vendors having over a billion tags deployed. One passive tag manufacturer offers more options than all the active tag players.
7. **Research and Development Investment** - This is not even close! The R&D for current and future expenditures clearly side with passive RFID because of standards. Passive tag manufacturers are competing in a standard plug and play world. Everything in active tags is about locking you into one OEM’s hardware.
8. **Largest Vendor Pool** – companies like Zebra, Motorola, Impinj, NXP, Alien, Omni ID, Zebra, Avery Dennison, Intermec, RFID Global, Tego, Smartrac, Xerafy, Confidex, and hundreds more make up the passive RFID industry. These chip, tags, reader and antenna companies provide innovation and advancement in passive RFID solutions that eclipses the active tags. They all work together, and you can substitute one brand for another. This is not available for active tags. Bottom line – more competition leads to a better value proposition for passive tags.

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<sup>1</sup> Personalization = custom encoding, printing of bar codes, human readable information, logos, etc.

9. **Selection and Options** – There are thousands of types and sizes of tags to choose from that work with any ISO standard passive RFID readers. For example, we are now seeing tags which measure temperature or have bus interfaces to talk to any sensor and report their data via the RFID wireless link. You may purchase off the shelf tags optimized for different use cases, materials and enclosure protection. For example:
  - a. Passive tags for plastic, steel, concrete, wood, titanium, etc.
  - b. Passive tags for surgical instruments, OR sponges, wheel chairs, etc.
  - c. Passive tags for automotive paint lines, etc.
  - d. Passive tags which are tiny (the size of a button)
  - e. Passive tags which read from a few millimeters to 50 meters
10. **Intrinsically safe and Autoclavable** – passive tags satiate this special need and offer more choice and lower cost versus active.
11. **Disposable** – With low cost tags, the consumables and disposable use cases that were not feasible with active are now cost effective with passive. With passive tags you can track pallet, carton and individual items with low cost disposable passive tags. This is almost always not possible with active due to its cost. Supply Chain Managers rejoice with inventory efficiencies and real time location tracking from storeroom to PAR levels throughout the facility. Wristbands and visitor badges can be discarded after one use instead of incurring reprocessing costs keeping with best practices for infection control and use cases in theme parks, hospitals, visitor badges, clean rooms, etc.
12. **Size** – Passive Tags can always be made smaller than active because there is no need for bulky batteries. With smaller tags you have more options to attach the RFID tag to an item. Some tags are as easy to attach as a post it note! And the same size!!
13. **Serialization of assets** - Passive tags can store data that is specific to that asset/item. For example, with a simple RFID scan the tag can report lot number, serial number, expiration date (and much more) for inventory control, rental and rebate management purposes designed to trigger alerts, workflow and data analytics for machine learning. It can also have a 3D bar code printed on demand giving it the edge in always available never shutting down a workflow.
14. **Read and Write** - Passive tags by design store data that is readable and writable. This easy to read/write capability coupled with the disposable/consumable concept allows for inventory control, usage, costs per use (also includes per procedure, stay, etc.) and patient charge capturing. In fact, passive tags can be printed at the time of receipt of inventory or raw materials providing human readable attributes on the label: item description, item number, bar code, unit of measure, logo that correspond to the data stored on the tag. The human readable benefit means you have a contingency plan to keep the system working.
15. **Duty Cycle** – Passive tags are on all the time they are within your RTLS (real time location system) coverage area versus active tags that spend more time in sleep mode than being on because they need to ensure their batteries may last for 1 to 3 years. Many active tags wake up for a few seconds every 5-15 minutes to transmit and engage with the RTLS system. During sleep they are not being watched by the RTLS solution and you lose tracking benefits. Therefore, you have no tracking gaps with passive.