

Active vs. Passive RFID for asset tracking

How V-Tag active mesh tags and passive UHF RFID compare across cost, installation, location granularity and sensing — and how to match the technology to the job.

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PRODUCT

V-Tag active RFID · AssetWorx!

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ABSTRACT

Assets earn their keep only when you can find them. Staff time spent hunting for a wheelchair, a test rig or a tool is cost that never shows on the balance sheet. This paper compares two proven RFID approaches — InfinID's V-Tag active mesh tags and conventional passive UHF RFID — so you can choose the right one, or run both together on AssetWorx!

01 The cost of not knowing where things are

Asset tracking is a concern for many businesses and government departments. A company may own a great deal of high-value equipment, yet those assets are of little use if they cannot be located — and if employees spend valuable time searching for them, the hidden cost to the enterprise adds up quickly.

A hospital may send staff through the building looking for an unused wheelchair or stretcher to meet demand at peak times. A maintenance technician may be delayed running key tests because the test equipment cannot be found when it is needed. The answer is asset tracking with RFID (Radio-Frequency Identification) — and there are two very different ways to do it.

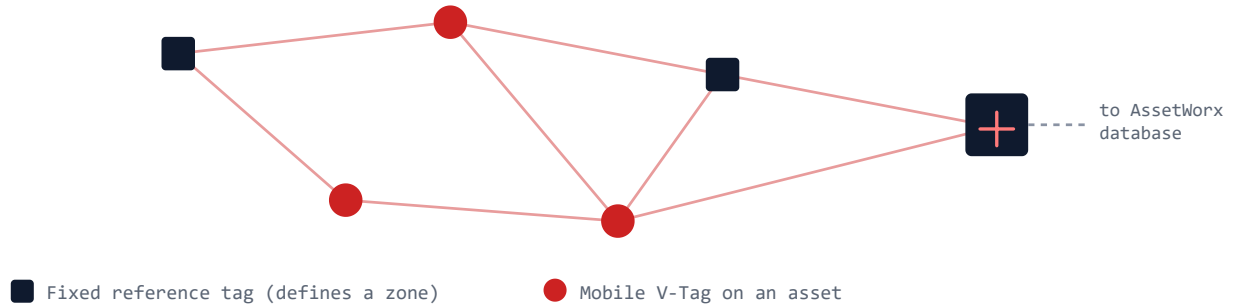
02 Two approaches

V-Tag active RFID

V-Tag active RFID tags from InfinID Technologies are battery-powered tags with a read range of up to about 300 feet. When a tag powers up, it coordinates with the other tags in range to form a **self-healing Zigbee mesh network** for communication. A set of **fixed reference tags** that never move define the zones of a facility; each mobile asset tag then estimates which zone it is in by comparing the radio-signal strength it hears from those reference tags. A single low-cost V-Tag gateway per floor relays this information to a central database. V-Tag was introduced to the market in 2013 and is protected by U.S. Patent 8,094,022 B2.

Passive RFID

Passive RFID uses small tags similar to the anti-theft tags seen in stores. A passive tag has no battery; it is energised by radio energy from a nearby reader, so its read range is limited to roughly 10–20 feet depending on tag and reader. Passive tags have been available for more than twenty years, are inexpensive, and come in a wide variety of sizes and form factors — but every read point needs its own fixed reader and antenna.



V-TAG ACTIVE MESH — TAGS RELAY FOR ONE ANOTHER; ONE GATEWAY PER FLOOR REACHES THE DATABASE

03 Four advantages of V-Tag over passive RFID

1 • Cost

The V-Tag active solution avoids placing fixed readers at every chokepoint in a building. Those readers can cost thousands of dollars each and every one needs power and network connectivity, wired or wireless; the finer the location detail you want, the more readers you must buy. V-Tag tags instead coordinate into their own mesh, so a single low-cost gateway per floor is enough to carry asset location back to the database.

2 • Ease of installation

Because there is no reader-and-antenna infrastructure to cable, mount and commission, a V-Tag deployment is largely a matter of placing fixed reference tags to mark your zones and attaching mobile tags to your assets. Coverage can be extended by adding more fixed tags where you need finer zones — no electrician, no structured cabling run to each read point.

3 • Zone / room-level location

The most valuable advantage is that V-Tag locates an asset to the zone — typically room level. Doing this with passive RFID would require an expensive reader at the door of every room. With V-Tag, a tracked asset appears as a dot within a room on the AssetWorx! map and moves from room to room as the asset does. This is zone-level location that settles in about 3–4 minutes as the mesh reconciles — it is not a real-time positioning system.

4 • Sensor measurements & alerts

V-Tag active tags can take periodic sensor readings — temperature, battery level and light — and every tag carries a sensitive accelerometer to detect movement. Thresholds can be set so a tag raises an alert the moment it is moved from its location or an environmental limit is exceeded. A passive tag, unpowered whenever it is away from a reader, can do none of this.

04 Side by side

DIMENSION	V-TAG ACTIVE RFID	PASSIVE UHF RFID
POWER	Battery, 3–6 yr, replaceable	None — energised by the reader
TYPICAL READ RANGE	Up to ~300 ft	~10–20 ft

DIMENSION	V-TAG ACTIVE RFID	PASSIVE UHF RFID
INFRASTRUCTURE	One gateway per floor; tags form their own mesh	A fixed reader & antenna at every read point
LOCATION DETAIL	Zone / room-level, settles ~3–4 min	Read-point (where a reader sees the tag)
SENSING & ALERTS	Motion, temperature, light, battery; threshold alerts	None away from a reader
BEST SUITED TO	High-value assets, room-level location, sensing, sparse infrastructure	High-volume item-level, portals & dock doors, disposable tagging

05 When passive RFID is the right choice

Active tags are not always the answer. Passive RFID is the better fit when you need to read many items very cheaply at a defined point — a dock door, a portal, a checkout — or where a disposable, battery-free tag on every item matters more than continuous location. The two technologies are complementary, and AssetWorx! runs **both active V-Tag and passive UHF RFID on one platform**, so a single deployment can use active tags for high-value movable assets and passive tags for high-volume item flow.

06 Deploying V-Tag

V-Tag active tags are straightforward to deploy. The usual route is a turnkey system on InfinID's AssetWorx! software — a full asset-management platform with a floor-plan map display, an asset database, label printing and an open REST API for feeding your ERP, reporting and analytics. AssetWorx! runs on-premises or in the cloud, and InfinID solutions are delivered through an authorised reseller network.

HOW TO READ V-TAG'S ACCURACY HONESTLY

V-Tag reports **zone / room-level** location over a self-healing Zigbee mesh, and a position settles in about **3–4 minutes** as the mesh reconciles. It is an active-RFID zone-location system — not RTLS, not real-time or sub-second, not Bluetooth, and not a beacon-positioning system.

See where V-Tag fits your facility.

Tell us what you need to track and we'll point you to the right active or passive solution.

REQUEST A QUOTE

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