New in The RFID Shop

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Which Tag?

With thousands of RFID tags on the market and new ones added daily, how can you make an informed decision as to which tag is right for your RFID system? Read here:

HID's 7-point guide to the right RFID Tag

1. **Operating Frequency – LF, HF or UHF?**

    Each RFID system operates within one of three bands on the electromagnetic spectrum: low frequency (LF), high frequency (HF), or ultrahigh frequency (UHF).

    In general:

    as operating frequency increases, data processing speed and read range (the distance between the powered reader and the passive tag it reads) increases.

    However, increasing frequency tends to decrease a radio wavelength's ability to penetrate some materials.

    -   LF is a cost effective option for applications allowing consistent physical placement of tags on items, enabling readers to identify individual tags one at a time at close range. LF is almost not affected by the environment e.g. water or metal.
    -   HF tags can be read from distances of a few to several inches, allowing greater flexibility for tag and reader placement, and enabling higher processing speed and accuracy. In addition, HF processing enables larger memory capacity on each tag.
    -   UHF technology is rapidly expanding the boundaries of data collection speed and accuracy. Some UHF tags can be scanned from up to 25 feet (8 meters) or more, with readers identifying multiple tags simultaneously. Using UHF, an entire truckload of hundreds of individually tagged containers can be accounted for in the few seconds it takes for a truck to roll into or out of a distribution point. On the other side, UHF is sensitive to the tag environment for issues like reflection, dampening, detuning.

2. **Environmental Conditions – Quiet and clean or harsh and mucky?**

    In a stable environment, such as tagging books in a library, a relatively modest housing will provide adequate protection for each tag's electronic components, so a paper label would be good enough.

    At the other end of the spectrum, tags used in many industrial applications must perform despite repeated exposure to extreme heat or cold, physical impact, vibration, moisture and chemical agents. Here you will need to look at rugged tags.

Consider the conditions tags will be exposed to when deployed in your application.

3. Composition and contents of tagged items – Are you tagging humans, metal containers or books?

The RFID tags and readers can interact with the surface material on which tags are mounted, e.g. glass can have the effect of attenuation on the RF signal whilst metal may reflect and plastics detune the part of the signal.

Liquids may also impact readability, both as contents of a tagged container, and when liquids are present in close proximity to tags and readers.

4. Physical space available for tag placement – Big or small, visible or invisible, awkward or plain?

Tags come in a multitude of sizes and shapes, from high-visibility units to be placed on the exterior of 45-foot cargo containers, to tiny tags that attach discreetly or are embedded into small objects.

It is important to know tag placement options and potential size limitations for each item to be tagged as this will help identify the tag size and shape that is right for your application.

5. Optimal mounting method – Glue, screw, tie, embed?

The optimal mounting method will depend upon a combination of where a tag will be secured, the environmental conditions it will be exposed to, and the composition of the surface on which the tag will be placed.

There are many different options available, from ties to holes to glue.

6. Memory capacity – High or low? How much info does the tag need to store?

Tags with large memory capacities enable more detailed records. Still, low memory tags are sufficient for some tasks when used with an on-line database that holds the additional data. Very little memory space is required to store simple codes.

However, technological advancements are packing larger amounts of data in ever-shrinking integrated chips. High memory tags are redefining RFID potential. A single tag can securely store detailed maintenance records for a piece of industrial equipment or fleet vehicle. Equally, complete records of production process steps stored in a high-memory tag can provide instant status information even in-off line scenarios, when no real-time database access is possible. For many RFID users, increasing tag memory capacity has significantly expanded logistics tracking and reporting capabilities.

7. Still not happy? - Mix and match components for a custom solution

If the first 6 items above have not revealed the ideal tag for your requirements, explore the potential of a custom design. Mixing and matching standard components to create a custom tag can be cost effective, while optimizing the potential of your logistics application.