CHAPTER 04
RFID Standards

What are RFID standards?

RFID standards are guidelines or specifications for all RFID products. Standards provide guidelines about how RFID systems work, what frequencies they operate at, how data is transferred, and how communication works between the reader and the tag.

Why are RFID standards important?

RFID standards help ensure that RFID products are interoperable, regardless of the vendor or user. They also provide guidelines by which companies can develop complementary products, such as different types of tags, readers, software, and accessories. Additionally, standards help broaden markets and increase competition within the industry, which brings the prices of standardized RFID products down. RFID standards also help increase widespread confidence in the technology.

Who sets RFID standards?

Standards are developed and issued by industry-specific, national, regional, and global bodies. The more global the standard is, the more bodies are involved in its development. International organizations that issue RFID-related standards include EPCglobal (a GS1 venture), the International Electrotechnical Commission (IEC), the International Standards Organization (ISO), and the Joint Technical Committee (JTC 1), a committee formed by ISO and IEC. Regional regulatory entities that govern the use of RFID include the Federal Communication Commission (FCC), which is in charge of the United States, the European Telecommunications Standards Institute (ETSI), which operates in Europe. Other regions have their own regulatory entities.

Organizations that oversee RFID standards for specific industries include the Association of American Railroads (AAR), the Automotive Industry Standards Group (AIAG), the American Trucking Associations (ATA), and the International Air Transport Association (IATA). Additionally,

the GS1 VICS Item Level RFID Initiative (VILRI) oversees standards around item-level tagging and the use of RFID technology throughout the retail supply chain.

What are the existing RFID standards?

Active RFID, passive LF RFID, passive HF RFID, and passive UHF RFID all have their own unique standards governing their associated products. See **The Different Types of RFID Systems** for more information.

Passive UHF RFID is currently the only type of RFID to be regulated by a single global standard. This standard is called EPCglobal UHF Gen 2 V1, or just UHF Gen 2. UHF Gen 2 defines the communications protocol for a passive backscatter, reader-talks-first radio frequency identification (RFID) system operating in the 860 MHz - 960 MHz frequency range. EPCglobal certification testing includes conformance testing, which ensures that RFID products are compliant with the UHF Gen2 standard, and interoperability testing, which makes sure that all aspects of the tagreader interface are properly designed to interoperate seamlessly with other Gen 2 certified products. While most passive RFID tags use the energy from the RFID reader's signal to power on the tag's integrated circuit (IC) and backscatter to the reader, BAP tags use an integrated power source (usually a battery) to power on the IC, so all of the captured energy from the reader can be used for backscatter. Unlike transponders, BAP tags do not have their own transmitters.

An update to the UHF Gen 2 standard, called UHF Gen 2 V2, or just G2, is in the process of being ratified. This new standard builds on the original V1 standard, but ensures that future RFID communications have more complex and powerful security options to protect data and prevent tag counterfeiting.

Under the G2 standard, the user is able to hide all, part, or none of the tag's memory. Depending on what the reader's access privileges are, and its proximity to the tag, the reader's ability to access and/or modify tag data varies. This prevents tag data theft or tampering.

The G2 standards also establishes an anticounterfeiting measure that involves cryptographically authenticating tags. UHF Gen2 V1 tags send static replies back to the reader, making it easy for cloners to create counterfeit tags. Under G2 standards, each time a reader sends a signal to a tag it sends a different secret number and the tag computes a reply specific to that interaction.

Congratulations!
You've made it through the RFID Technology Primer. Now you have a basic understanding of the fundamentals of an RFID system. Interested in learning if RFID is right for your business? Follow one of the links below or jump straight to our guide on choosing an RFID solution provider.

GO TO CHAPTERS

Choose a chapter:

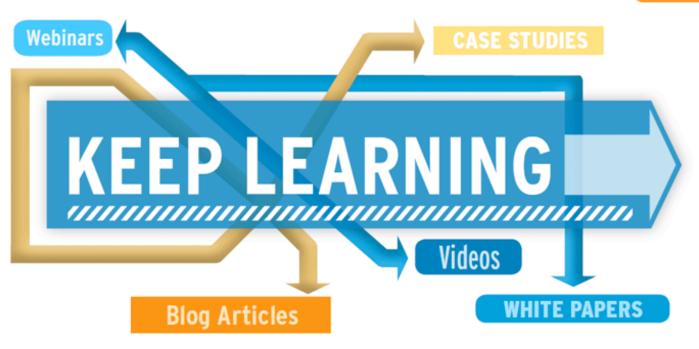Chapter 1: What is RFID?
Chapter 2: How Do RFID Systems Work?
Chapter 3: The Different Types of RFID Systems
Chapter 4: RFID Standards

READY TO GET STARTED WITH RFID?

Download this free e-book.

DOWNLOAD NOW!

Webinars

CASE STUDIES

KEEP LEARNING

Videos

Blog Articles

WHITE PAPERS

Impinj is the leading provider of RAIN RFID solutions that provide Item Intelligence in retail, pharmaceutical, healthcare, food and beverage, manufacturing and supply chain logistics, and many other industries.

Explore Impinj

Solutions

Products

Support

Investor Relations

Where to Buy

About Us

Resources

CONTACT US

Terms of Use | **Privacy Policy** | **Trademarks** | **Patents**