

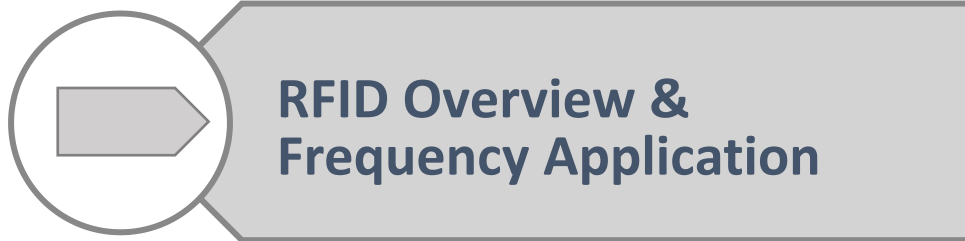


LightPioneer

LightPioneer RFID Tags

Overview and Application

2017.7.14

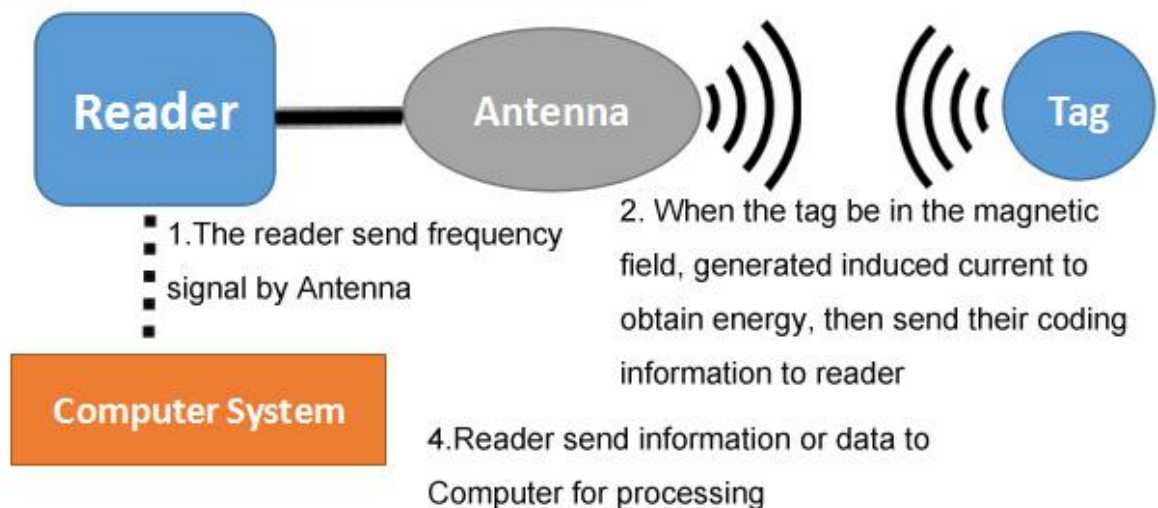


What is RFID

RFID stands for Radio Frequency Identification, is a non-contact automatic identification technology. The basic principle is to use a radio frequency signals and spatial coupling (inductance or electromagnetic coupling) or radar reflection of the transmission characteristics, to achieve the identification of objects automatically identified.

RFID Tag Working Process

3. Reader Collecting information and decoding

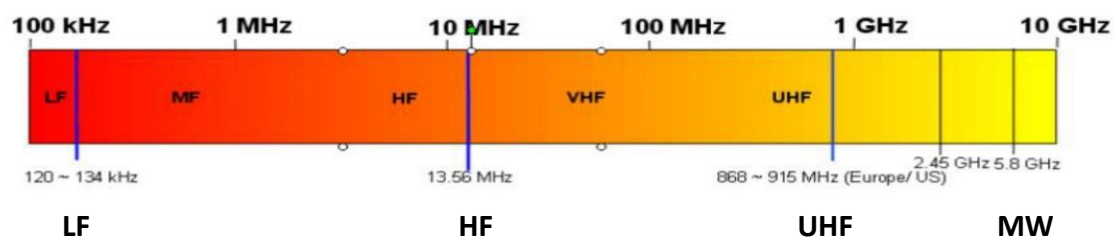


RFID Frequency Band

RFID frequency band is the frequency range that RFID reader send, receive and recognize the tags' signal through antenna.

The different frequency range of RFID Tags will influence its application features. In the RFID System, the tags should keep same frequency with the readers, like we listen the FM Radio.

Based on application features, RFID frequency band divides into LF, HF, UHF and MW.

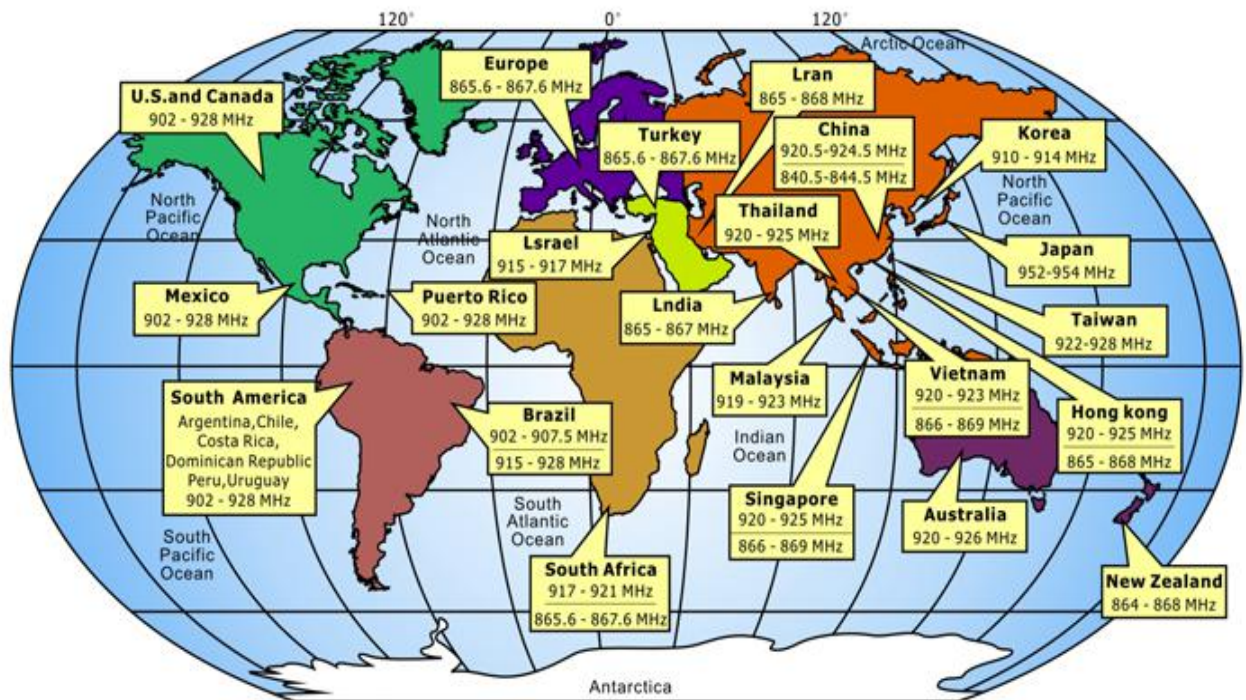


Different Frequency Band Features

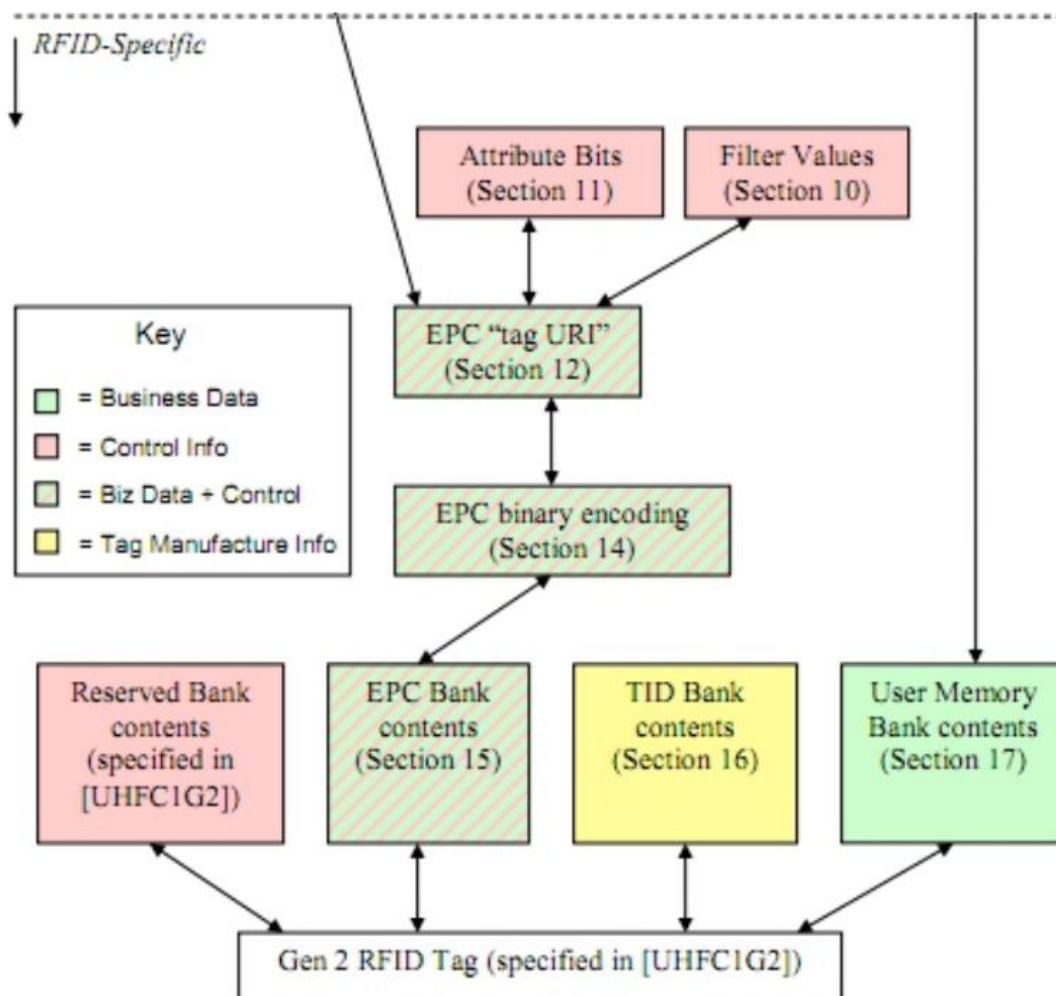
UHF is the Worldwide Standard for Recognition application, its technology can satisfy the scale, stabilization, low cost, and achieved simplification in Recognition.

Frequency	LF	HF	UHF		MW
	125.124KHz	13.56MHz	433.92MHz	860-960MHz	2.45GHz
Reading Range	<60cm	about 60cm	50-100cm	3.5-5m(P) about 100m(A)	below 1m(P) about 50m(A)
Features	-High Pirce -Performance will not be influenced by Environment	-Lower price than LF -Suitable for short range and multiple recognition	-Long Range recognition -Real time tracking -Sensitive to Container inside humidity/ Shock and other environment	-Advanced IC technology achieve cheap cost -Outstanding performance for Multi-tag reading	-Similar features with 900MHz frequency band -Most susceptible to environment
Operation Mode	Passive	Passive	Active	Passive/ Active	Passive/ Active
Recognition Rate	Low Speed<-----> High Speed				
Environment Influence	Slow<-----> Fast				
Tag Size	Big<-----> Small				

Worldwide RFID UHF Map



UHF Tag Chip Standard Structure and Features



Based on EPC C1G2 Standard, the UHF Chip inside structure integrated into:

TID/ EPC /UESR MEMORY /RESERVED

TID is one-time factory burn, can not be erase or change.

What is EPC Standard

- EPC global is a nonprofit organization jointly sponsored by UCC and EAN, the world's largest retailer Wall-Mart chain, Tesco and more than 100 US and European circulation companies are EPC members. At the same time, by the United States BEA, IBM, Microsoft, Auto-ID Lab provide technical research support.
- This organization is responsible for EPC global number registration management in addition to industry standards. EPC global system is a system based on EAN • UCC encoding. As a code for the flow of process information for products and services, the EAN • UCC code has a set of the world's only identification code which tangible or intangible products require, including trade projects, logistics units, location, assets, service relationships, etc.
- The EAN • UCC logo code is created with the origin of the product or service at the source of the distribution, the flow of goods or services runs through the whole process. EAN • UCC logo code is a fixed structure, meaningless, globally only one full digital code.
- At present, EPC global has developed to the Class1Gen2 standard, the next generation of standards has been brewing.
- In China, EPC has formed a practical application standard, but because of closed-loop projects more, has not yet formed a large-scale Modular and EPC coded open loop applications.

UHF RFID Tags

General UHF RFID Tag



Mainly made of paper, Inlay Encapsulation

Single-use, Common environment mainly

Sensitive Cost, decrease year by year

Not good Durability

Can not work on metal and liquid surface

Special UHF RFID Tag



Use special material to processing production

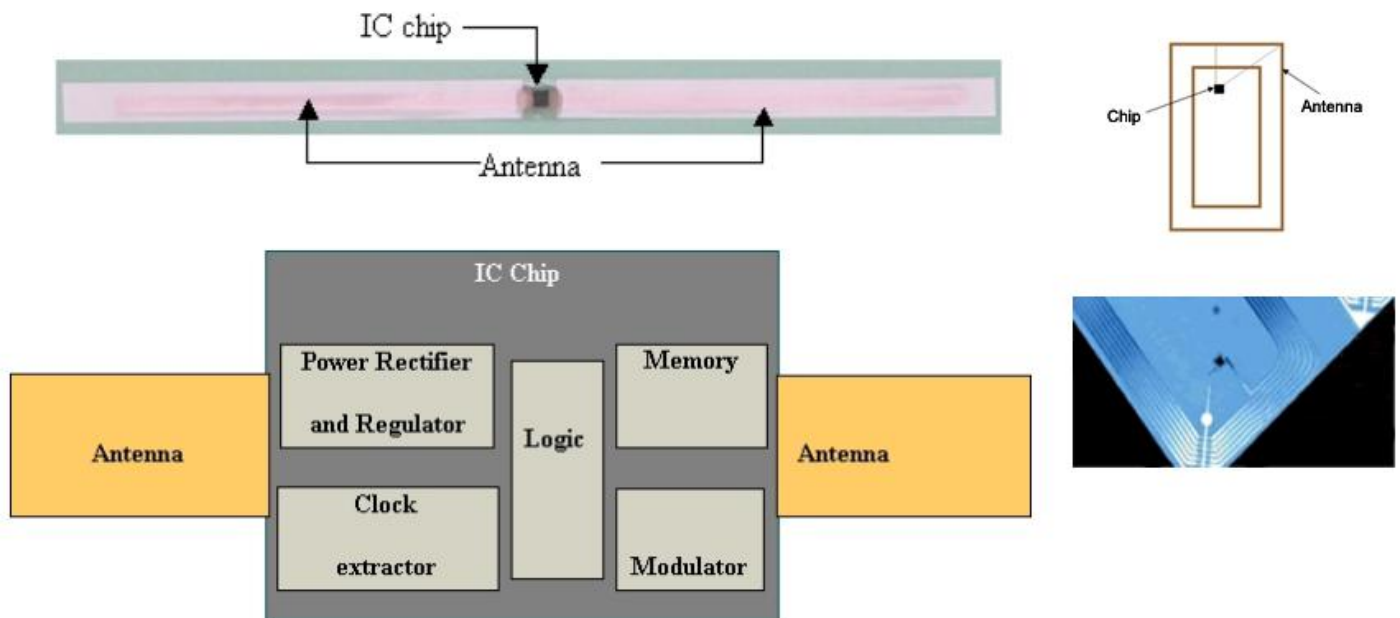
Satisfy metal/liquid harsh or outdoor environment application

With long life and recycling use features

High cost but cost-effective based on long-term use






Real special tag is a one-time processing production

UHF RFID Tag Structure



Chip and Antenna combination is Inlay, which is the basic part of RFID Tag

General UHF RFID Tag Illustration and Description

Tag Name	Chip	Antenna Size	Illustration	Application	Reading Range
F31	M3	18*32mm		Garment/ Asset Management	3m
E41-B	M4	8*95mm		Full-band, low dielectric constant materials universal tag Case level, pallet-level, gate-level applications, logistics industry	6m
E42	M4	19*68mm		Case level, pallet-level, gate-level applications, logistics industry	5m
B42	M4	8*22mm		Medium distance/ small size application Jewelry/ Cosmetics,etc	1m
F43	M4	16*26mm		Medium distance/ small size application Alcohol security, asset	3m

RFID Special Tags Overview

Special RFID tags, refers to RFID tags that are used in special circumstances or in harsh environments. In real life, the environment is more metallic environment, the usual RFID tags pasted on metal surfaces is not read properly or signal weakening. Special RFID Tag is to use special materials for processing, the RFID Tag affixed to the metal surface, achieve read performance.



RFID Special Tag Application Introduction

Steel Production



Coil Logistics



Power Plant Application



Bracket Application



Automobile
Production Line



Government Agency



Navy Application



Airborne Application



Slaughter Management



Anti-counterfeiting



Casino Chips



City Pipe Network



Telecommunication
Equipment



UHF RFID Special Tags Features

1. RFID Tag support Read and Write (Data can be written many times)
2. Greater data storage capacity and higher data transfer rates
3. Readers and Tags can work even out of the direct line of sight
4. Contact-free, far reading distance
5. The reader can simultaneously correspond with a plurality of tags (anti-collision), high inventory velocity, to save time
6. More environmental suitability, durability (dirt, dust, oil, abrasion, moisture, light)
7. A variety of packages, and wide application environment
8. Can not copy
9. Read reliability, first read accuracy to ensure efficient
10. No need to adjust the direction or rearrangement, identification time is short, without human intervention, automatic operation

UHF RFID Application

Application Area	Specific application
Logistic	Logistics in the process of tracking the goods, automatic information collection
Retail	Product sales data real-time statistics, replenishment, security
Manufacturing	Real-time monitoring of production data, quality tracking, automated production
Medical care	Medical equipment management, patient identification, work uniforms washing management
Garment	Supply chain management, store management
Security	Valuables (tobacco, alcohol, drugs) security, ticket
Asset Management	Various types of assets (precious, large number of high similarity, dangerous goods, etc.) management
Transportation	Taxi management, bus hub management, railway locomotive identification
Food	Fruits,vegetables,fresh, freshness of food management
Animal identification	Wild animal and pet identification management
Aviation	Passenger tickets, baggage tracking, parts management, freight and so on

UHF RFID Warehouse Management Application

Use UHF tag to write the corresponding product information, and automatically identify, query, compare the location/ shelves/ product information by reader installed on forklift. It will be quickly and accurately access the goods on the shelf. Warehouse staff use UHF hand-held reader to read tag information of shelves, location. It is not only to facilitate future inspection, but also at any time to view the dynamic goods and ensure product safety and flow.



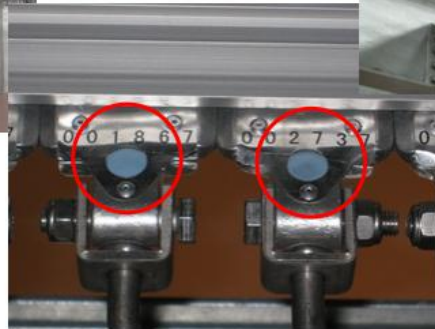
UHF RFID Asset Management Application

- Use RFID technology and GPRS Wireless transmission technology, to combine the daily management and asset management system, so as to achieve physical information and system information real-time synchronization.
- To achieve ‘asset life cycle automatic tracking management’, provide accurate and scientific reference for enterprise investment decision-making, network planning and design, network optimization, rational allocation of assets. Effectively increase the marginal efficiency of investment and improve asset utilization, reduce unnecessary equipment investment and idle waste.



UHF RFID Food Security Application

Pigs wholesale market using RFID system and automatic scale system combination, making the weight information of each pig with an unique identification number is automatically entered into the system, customers can select the pork through the ID number and settlement. Through the use of advanced RFID systems, to provide wholesale market information accuracy, to achieve rapid trading and settlement.



UHF RFID Production Line Application

Product quality tracking

Key parts comparison, avoid assembly error

Online parts inventory reminder, real-time stocking

In production products quality recording

Production status monitoring, electronic billboard guidance





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