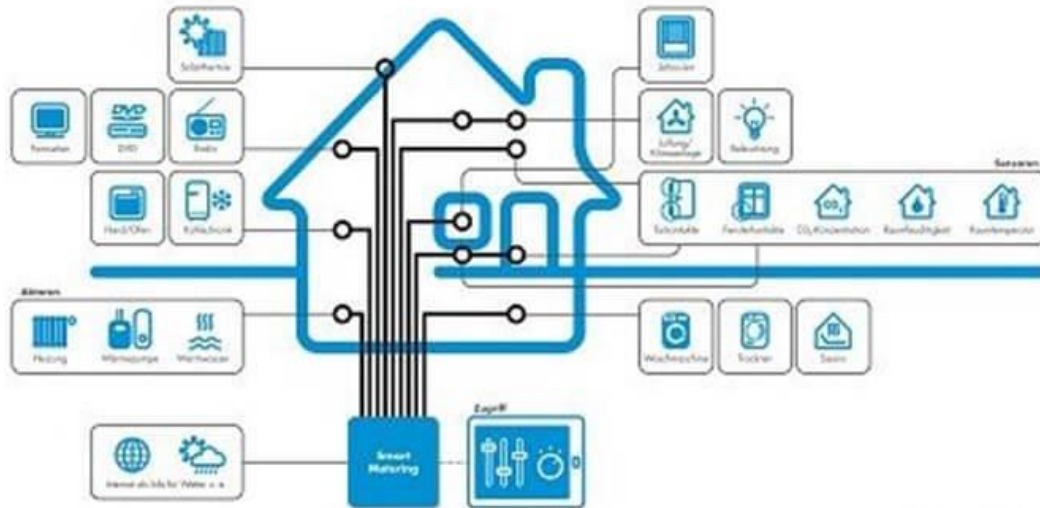




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What Is The ISM Band?



[What is the ISM band](#) and what are the main frequencies in the ISM band? After the read, you will get the answer.

ISM band means

The ISM band (Industrial Scientific Medical Band) is a band that is primarily open for use by three major organizations: industrial, scientific, and medical.

The ISM band is an unlicensed (Free License) band, users do not need a license and there are no restrictions on the use of the so-called license.

The ISM band allows anyone to transmit data at will but limits all power to a very short distance between transmission and reception so that different users do not interfere with each other.

In the United States, the ISM band is defined by the Federal Communications Commission (FCC), and most other governments have set aside ISM bands for unlicensed use.

Currently, many countries use ISM bands for radio devices (especially for home devices) such as garage door controllers, cordless phones, wireless mice, Bluetooth headsets, and wireless LANs.

RFID operating frequency selection, to take into account other radio services, cannot cause interference and impact on other services, and thus RFID systems can usually only use the ISM frequencies reserved especially for industrial, scientific, and medical applications.

The main ISM band frequency is as follows.

1. ISM Band Frequency 6.78MHz

This frequency range of 6.765 ~ 6.795MHz, belongs to the short-wave frequency, this frequency range has been assigned by the International Telecommunication Union as the ISM band used

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internationally, and will increasingly be used by RFID systems.

This band was initially set for shortwave communications, according to the propagation characteristics of electromagnetic waves in this band, shortwave communications can only reach a very small role in the daytime distance, up to a few hundred kilometers, and can spread across the continent at night.

Users of this frequency range are different categories of radio services, such as radio broadcasting services, radio meteorological services, and radio aviation services.

2. ISM Band Frequency 13.56MHz

This frequency range is [13.553 ~ 13.567MHz](#), in the shortwave band, but also the ISM band. In this frequency range, in addition to inductively coupled RFID systems, there are other ISM applications, such as remote control systems, remote control model systems, demonstration radio systems, and pagers.

This band was also initially set up for short-wave communications, and according to the propagation characteristics of electromagnetic waves in this band, wireless signals allow day and night transcontinental contact. The users of this frequency range are different categories of radio services, such as news agencies and telecommunication agencies, etc. Most of the RFID operating frequency is [13.56MHz](#) (another operating frequency of 125-135KHz).

3. ISM Band Frequency 27.125MHz

This frequency range is 26.957~27.283MHz. In addition to inductively coupled RFID systems, ISM applications in this frequency range include medical electrotherapy devices, industrial high-frequency welding devices, and pagers.

When installing an industrial 27MHz RFID system, special attention should be paid to any high-frequency welding devices that may exist nearby. High-frequency welding devices generate very high field strengths that will seriously interfere with RFID systems working at the same frequency.

In addition, when planning a hospital 27MHz RFID system, special attention should be paid to the possible existence of electrothermal therapies interference. Many domestic remote control toys work at 27MHz.

4. ISM Band Frequency 40.680MHz

This frequency range is 40.660~40.700MHz, which is at the low end of the [VHF band](#). In this frequency range, the main application of ISM is telemetry and remote control.

In this frequency range, the inductively coupled radio frequency recognition the role distance is small, and this frequency 7.5m wavelength is also not suitable for constructing smaller and cheaper backscatter electronic label, therefore this frequency band at present does not have the radio frequency recognition system work, belongs to the radio frequency recognition system is not very applicable frequency band.

5. ISM Band Frequency 433.920MHz

This frequency range for [430.050 ~ 434.790MHz](#), in the world range, to allocate to the amateur radio service use, the frequency band is roughly located in the middle of the amateur radio band, at present has been various ISM application occupied.

This frequency range belongs to the [UHF band](#), where electromagnetic waves will show

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significant attenuation and reflection when they encounter buildings or other obstacles.

This band can be used for backscatter RFID systems, in addition to small telephones, telemetry transmitters, wireless headsets, low-power wireless intercoms in close proximity, and wireless central locking devices for automobiles.

In this band, due to the many applications, the mutual interference of ISM is relatively large. Many domestic RFID also use this [UHF frequency](#).

6. ISM Band Frequency 868 MHz

This frequency range is from [868 to 870 MHz](#), in the UHF band. Since 1997, this frequency band in Europe allows the use of short-range devices, so it can also be used as an RFID frequency.

Some Far Eastern countries are also considering allowing the use of this frequency range for short-range devices.

7. ISM Band Frequency 915 MHz

In the United States and Australia, the frequency range [888 to 889 MHz](#) and [902 to 928 MHz](#) has been available and used by the backscatter RFID system.

This frequency range has not been provided in Europe for ISM applications. The frequency range adjacent to this is occupied by the cordless phones produced according to CT1 and CT2 standards.

8. ISM Band Frequency 2.4 GHz

This ISM band frequency range is [2.400 ~ 2.483GHz](#), belongs to the microwave band, also in the UHF band, and amateur radio enthusiasts and radiolocation services use the frequency range partly overlap.

Electromagnetic waves in this band are quasi-light propagation, buildings and obstacles are good reflective surfaces, and electromagnetic waves are highly attenuated during transmission.

In addition to this frequency range, which is suitable for backscatter RFID systems, typical ISM applications in this band include [Bluetooth](#) and [802.11](#) protocol wireless networks.

Microwave / Bluetooth / [WIFI](#), etc. are used in this frequency, in addition to domestic RFID also uses this frequency.

9. ISM Band Frequency 5.8GHz

This ISM frequency range is [5.725 ~ 5.875GHz](#), which belongs to the microwave band and partially overlaps with the frequency range used by amateur radio hobbyists and radiolocation services.

Typical ISM applications in this frequency range are backscatter RFID systems, which can be used for highway RFID systems, and also for gate opening and closing (in stores or department stores) systems.

It is a very important frequency band, which is beginning to be widely used.

10. ISM Band Frequency 24.125GHz

The range of this ISM band frequency is 24.00~24.25GHz, which belongs to the microwave band and partially overlaps with the frequency range used by amateur radio amateurs, radiolocation services, and earth resources satellite services.

In this frequency range, there is no radio frequency identification system work, this band is mainly used for mobile signal sensors, also used for transmission of data radio directional system.

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11. Other ISM band frequency applications

The frequency range below 135 kHz is not reserved as industrial, scientific, and medical (ISM) frequencies, and this band is heavily used by various radio services.

In addition to ISM frequencies, the entire frequency range below 135 kHz RFID is also available, because this band can work with larger magnetic field strength, especially for inductively coupled RFID systems.

According to the propagation characteristics of electromagnetic waves in this frequency band, radio services occupying this frequency range can reach a radius of more than 1,000 km.

In this frequency range, the typical radio services are aviation navigation radio service, navigation radio service, timing signal service, frequency standard service, and military radio service.

As with this kind of frequency work the radio frequency recognition system will make the read-write around several hundred meters radio clock failure, in order to prevent this kind of conflict, the future may stipulate a protection zone between 70 ~ 119 kHz, does not allow RFID system to occupy.

In the wireless product frequency band management in this regard regulations are not sound. Among them, [2.4GHz](#) in different countries are license-free bands, while the following are other different free bands:

North America: [315MHz](#) and [915MHz](#), 902~928MHz

EU region: [433MHz](#) and [868MHz](#) and some other bands in Japan and Australia.

The 800MHz and [900MHz bands](#) in China are currently occupied by the [GSM cellular](#) mobile network, with the vast majority of products operating in the [433 MHz](#).

The 315MHz band is the main band for early wireless remote control products, so the wireless magnetic environment in this band is quite complicated, and the wireless data transmission is not very reliable.

The [433MHz band](#) is also becoming more and more complex as many new car remote controls are now gradually using the band. So these two bands are more often used for transmitting simple data on the wireless remote control.

For water, electricity, gas, and other public utility metering data collection, the national radio administration has released two application-free wireless metering bands (470-510MHz), specifically for wireless data transmission of civil metering equipment.

[C&T RF Antennas Inc](#) manufactures the ISM band antennas, [contact us](#) for the ISM band antenna specifications.

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