

## What is Project 25?

Project 25 (P25) is a standard for the manufacturing of interoperable digital two-way wireless communications products. Developed in North America under state, local and federal representatives and Telecommunications Industry Association (TIA) governance, P25 is gaining worldwide acceptance for public safety, security, public service, and commercial applications. The published P25 standards suite is administered by the Telecommunications Industry Association (TIA Mobile and Personal Private Radio Standards Committee TR-8). Radio equipment that [demonstrates compliance](#) with P25 is able to meet a set of minimum requirements to fit the needs of public safety. These include the ability to interoperate with other P25 equipment, so that users on different systems can talk via direct radio contact.

The P25 standard was created by and for public safety professionals.

## What Are the Benefits of P25?

From the beginning, P25 has targeted four primary objectives:

- *Allow effective, efficient, and reliable intra-agency and inter-agency communications*

... so organizations can easily implement interoperable and seamless joint communication in both routine and emergency circumstances.

- *Ensure competition in system life cycle procurements*

... so agencies can choose from multiple vendors and products, ultimately saving money and gaining the freedom to select from the widest range of equipment and features.

- *Provide user-friendly equipment*

... so users can take full advantage of their radios' lifesaving capabilities on the job – even under adverse conditions – with minimal training.

- *Improve radio spectrum efficiency*

... so networks will have enough capacity to handle calls and allow room for growth, even in areas where the spectrum is crowded and it's difficult for agencies to obtain licenses for additional radio frequencies.

## What is the Status of P25 Today?

P25 systems are available today and being deployed globally. Many organizations have mandated that new land mobile radio system purchases follow P25 standards. P25 is ongoing. The standard continues to evolve as the needs of users and the capabilities of new technology advance. Both users and manufacturers have an important role to play in shaping P25.

## What is Required for P25 Compliance?

At a minimum, a P25 radio system must provide interoperability with these mandatory P25 Standard components:

- *The Common Air Interface (CAI) specifies how information is coded, transmitted and received over the air.*

It enables users to interoperate and communicate digitally across networks, agencies, and vendors.

- *The Improved Multi-Band Excitation (IMBE) vocoder converts speech into a digital bit stream.*

Test panels judged IMBE as the coding scheme most successful at making male and female voices audible against background noises such as moving vehicles, sirens, gunshots, and traffic noise – the conditions of public safety use.

P25 has also defined standard modes of operation to enable multi-vendor interoperability for additional system functions: trunking, encryption, over-the-air rekeying, to name a few.

A set of defined system interfaces allow the P25 system elements to communicate with host computers, data terminals and the public switched telephone network (PSTN).

## Looking to the Future

There are two phases of P25 development:

- Phase 1 is completed.
  - It specifies a 12.5 kHz bandwidth.
- Phase 2 is in development.

It will use a 6.25 kHz equivalent bandwidth to allow better spectrum efficiency and benefit a greater number of users.

### What is Required for P25 Compliance?

At a minimum, a P25 radio system must provide interoperability with these two mandatory P25 Standard interface components:

- The Common Air Interface (CAI)
- The Improved Multi-Band Excitation (IMBE) vocoder

The CAI enables P25 radios to interoperate and communicate digitally across P25 networks and directly. This portion of the P25 standard suite was selected to meet the unique radio system needs of the public safety environment; coverage reliability, system design flexibility, and inter-vendor compatibility.

The IMBE vocoder sets a uniform standard for converting speech into the digital bitstream. IMBE was selected as the coding scheme most successful at making male and female voices audible against background noises such as moving vehicles, sirens, gunshots, and traffic noise – the conditions of public safety use.

These two components, when used together enable P25 users to interoperate and communicate digitally directly between units and across networks, agencies, and vendors.

P25 has also defined standard modes of operation to enable multi-vendor interoperability for additional system functions: trunking, encryption, over-the-air rekeying, to name a few.

Project 25 also continues to develop a set of defined system interfaces allow the P25 system elements to communicate with host computers, data terminals and the public switched telephone network (PSTN). These interfaces are critical to assure that P25 systems maintain compatibility with the evolving telecommunications and data-communications world.

Additional information available at [www.project25.org](http://www.project25.org)