

DHS Science and Technology Directorate

First Responders Group – Radio Internet-Protocol Communications Module

Upgrading legacy systems so first responders (and their equipment) can communicate

Often, first responders face challenges with communicating across jurisdictions during joint operations or major crises because of incompatible communications systems. Proprietary differences make it difficult for equipment by different manufacturers to communicate effectively.

The Project 25 (P25) suite of standards was developed to address this concern by producing a single set of compatible standards for all land mobile radio manufacturers to follow. These standards ensure equipment can reliably communicate, regardless of manufacturer. They also ensure a higher degree of interoperability among different systems, which can save limited agency funds by not having to replace otherwise-serviceable equipment to achieve interoperability. Replacing legacy base station equipment with newer models can cost response agencies up to \$15,000 per system.

As an alternative, the DHS Science and Technology Directorate (S&T), designed a P25-compatible, after-market technology solution — the Radio Internet-Protocol Communications Module (RIC-M) — that allows agencies to easily upgrade and reconfigure legacy systems at a low cost. RIC-M allows many older base station systems to be used for another 10 to 20 years.

Enhancing interoperability via open standards

Older base station equipment does not support open-standard interconnection, presenting a problem during emergencies when the exchange of vital information can instantly save lives and property. RIC-M provides a Voice over Internet Protocol bridge between base stations and multi-vendor dispatch equipment, allowing all portable radios to communicate to and from dispatch consoles.

Using an Ethernet cable, RIC-M connects a base station and various communications devices, to create an Internet Protocol bridge.



RIC-M allows interoperability between different vendor systems to seamlessly communicate. The module, which adheres to P25 standards, bridges portable radios, legacy base station systems, and dispatches consoles.



RIC-M is inexpensive and portable, making it ideal for connectivity during chaotic response scenarios.

With this bridge, portable radios are able to communicate through the base station/RIC-M to-and-from dispatch consoles via a local area network, in accordance with Telecommunications Industry Association (TIA) Standard P25 Fixed Station Interface Messages and Protocol (TIA-102.BAHA).

Since the project began in 2012, RIC-M prototypes have been tested with several dispatch consoles compliant with this standard. In November 2013, a prototype was field tested at the U.S. Department of Interior (DOI) Radio Laboratory in Denver, Colorado. In July 2014, production-ready RIC-Ms were then distributed to various agencies to evaluate with their existing equipment. Enhancements made since were based on feedback received during these evaluations.

Participating agencies included: DOI, U.S. Customs and Border Protection, U.S. Marshals Service (for use with the Federal Bureau of Investigation; Bureau of Alcohol, Tobacco, and Firearms and the Drug Enforcement Administration), the Federal Protective Service and the Montgomery County, Maryland Fire and Rescue Service.

RIC-M now available to response agencies

S&T filed applications for a utility patent and trademark for RIC-M, both still pending as of summer 2015. S&T has also licensed the technology (through a Cooperative Research and Development Agreement) to inventor Christine Wireless, Inc., as well as Avtec Inc., to manufacture and sell the devices. Response agencies can now purchase them directly from these two vendors and will soon be able to procure them via General Services Administration Schedules.



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To learn more about the Radio Internet Protocol Communications Module, contact SandTFRG@dhs.gov.