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DHS Science and Technology Directorate

Radio Internet-Protocol Communications Module

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

First responders often face challenges with communicating across jurisdictions during joint operations or 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 Department of Homeland Security 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 adheres to P25 standards, providing seamless interoperability between different vendor communications systems. The module bridges portable radios, legacy base stations, and dispatch 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).

RIC-M prototypes were tested for three years (beginning in 2012) with several local, state, and federal agencies using a variety of dispatch consoles compliant with this standard. Agencies participating in the testing include: the U.S. Department of Interior Radio Laboratory, 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.

Response agencies can now purchase RIC-M directly from two commercial vendors: Christine Wireless, Inc. (RIC-M inventor) at http://christinewireless.com/details and Avtec Inc. at http://www.avtecinc.com/scout/integration/ric-m. The device may also be procured via General Services Administration Schedules.

RIC-M sales will fund future first responder technology development

In 2015, S&T received both a RIC-M trademark and utility patent and licensed the technology to the two vendors to manufacture and sell. S&T owns the IP rights to the technology and will receive royalties on the sale of every RIC-M device for the next five years, perhaps even longer. All royalties will be used to fund new S&T technology development for first responders.

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

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