

## Bi-Directional Amplifiers (BDA)

Reliable In-Building Public Safety Radio Coverage  
to Safeguard Emergency Responses



# Is your building prepared to protect the people who protect you during an emergency event?

Introducing Honeywell's Farenhyt Series Bi-Directional Amplifier (BDA) emergency communication system designed to enhance in-building radio frequency (RF) signal coverage for public safety use.



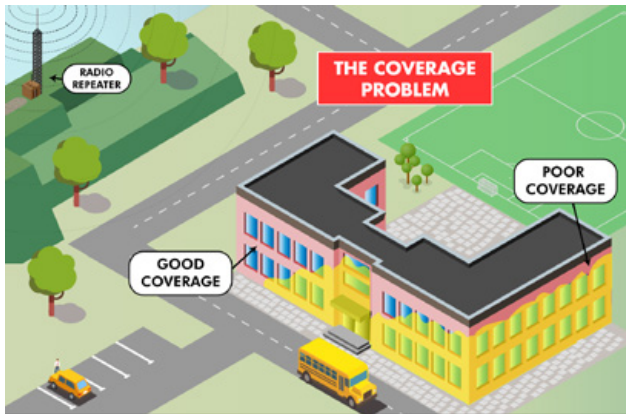
## Codes, Approvals, and Requirements

Emergency Radio Communication Enhancement Systems (ERCES) were first introduced in the 2009 International Building Code. The ERCES requirement was established to address the performance of emergency responders' portable radios inside buildings because building construction, building size, construction features, and other elements can absorb or block radio communications.

If a building does not meet the required signal strength (-95dBm), the only effective solution is the installation of a signal booster (BDA).

Today's codes and standards, like the IBC 2015 Section 916, IFC 2018 Section 510, NFPA 72 2010, NFPA 1221 2016, and UL2524, require all buildings to have approved radio coverage for emergency responders within the building based on the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building.





Building with Insufficient Public Radio Coverage – Non-compliant to Code



Building with Sufficient Public Radio Coverage – Code Compliant

## Solving the Coverage Problem

Concrete or metal construction, larger buildings, and underground structures have a negative impact on the in-building signal strength required for reliable communications. Buildings that use low-E glass windows will attenuate the signal from public safety radio systems. Many design professionals are not aware of the ERCES requirements. If ERCES is not referenced on a building submittal, the fire official should immediately notify the building official and design professional, in writing, that the ERCES must be evaluated. If the existing radio coverage has not been maintained, then ERCES must be provided.

### How to determine if a BDA System is beneficial to your building?

Typically performed by specialized FCC GROL certified technician and some fire department radio personnel, a RF Survey is accomplished by measuring the Downlink/Uplink signal strengths in decibels-milliwatts (dBm) using special measuring devices. Results are submitted to AHJ to determine if a BDA is required or if a waiver is appropriate.

### Why is Honeywell's Farenhyt Series BDA unique?

The Farenhyt Series Class B Bi-Directional Amplifier is a high-gain, high-power, band-selective signal booster that has been specifically designed from the ground up for UL2524 In-building 2-Way Emergency Radio Communication Enhancement Systems, NFPA and IBC/IFC standards compliance, to be the best choice for public safety and other mission-critical applications.

- Single portfolio suits any application across the U.S. with all Public Safety frequency bands supported; various models available for UHF, VHF, 700 MHz, 800 MHz, and multi-band
- All-inclusive and fully-integrated BDA with UL2524 In-building 2-Way Emergency Radio Communication Enhancement Systems listing, CSFM listing, NFPA 72 2010 Edition, NFPA 1221 2016 Edition, and IFC 2018 compliance
- Integrated dual power supply and battery charger with intelligent battery monitoring to cut costs and space
- Wider bandpass allows the use of a single BDA to cover multiple sub-bands
- Built-in Farenhyt Addressable Monitor Modules save wiring and installation costs
- RF resiliency, oscillation prevention and automatic uplink squelch support for safe operation and non-interference with public safety radio system
- Modular design for easier troubleshooting and field component replacement

# FAQs

## What are NFPA's requirements for annunciator at FACP or is FACP monitoring adequate?

A dedicated annunciator panel must be located in the fire command center or other location designated by the AHJ. The BDA status must also be monitored by the building's fire alarm system.

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## Does the Building Code require BDAs for Police and Fire Departments?

The code requires coverage for Emergency Responders. The AHJ will determine which Emergency Responder agencies need to be included in the system. Generally, it includes Fire, Fire Mutual Aid, Police and EMS.

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## Who determines what public safety agencies are to be supported under the provisions for "Emergency Responder Radio Coverage"?

The AHJ will determine which agencies will need coverage.

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## How does a system designer or system engineer determine what frequencies are to be supported?

The AHJ is required to maintain a document of technical information specific to these requirements.

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## Where multiple agencies are required to be supported, is each agency responsible for accepting or approving their respective system, or is that the sole responsibility of the Fire Official?

It is usually the fire marshal (AHJ) who provides the technical specifications and information on permitting and testing procedures and requirements for the jurisdiction.

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## What skills, education, or experience must a technician have to install, commission, and service a BDA system?

This depends on the jurisdiction, but typically FCC GROL or approved equivalent and manufacturer certification.

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### For more information

[www.hwl.com/bda](http://www.hwl.com/bda)

### Honeywell Fire Solutions

12 Clintonville Road  
Northford, CT 06472  
203.484.7161  
[www.honeywell.com](http://www.honeywell.com)

## How does one determine whether existing radio coverage is adequate, or justify whether an Enhancement System is warranted?

A RF Survey must be performed. Typically performed by specialized FCC GROL certified technician and some fire department radio personnel, a RF Survey is accomplished by measuring the Downlink/Uplink signal strengths in decibels-milliwatts (dBm) using special measuring devices.

The survey can be determined before the building construction starts with a signal survey on the building site followed by software-simulated radio propagation modeling. This results in heat maps that show predicted signal coverage levels.

Results are submitted to AHJ to determine if a BDA is required or if a waiver is appropriate.

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## What is the difference between the two BDAs: Class A Channelized vs. Class B Band Selective?

Each BDA amplifies a specific frequency range or bandwidth.

### Class A Classification

- Bandwidth less than 75 KHz categorizes the BDA by the FCC as Class A.
- BDAs that can amplify multiple <75 KHz channels are called Channelized Signal Boosters. The disadvantage is that they introduce signal delay, which in turn introduces signal distortion in signal overlap areas. They must be used with caution under special consideration.

### Class B Classification

- Bandwidth higher than 75 KHz categorizes the BDA by the FCC as Class B.
- Class B amplifiers are more common and can cover all channels within 800 and 700MHz public safety bands at the same time.