



**Iowa Statewide Interoperable Communications System (ISICS)
Standards, Protocols, Procedures**

ISICS Standard: Bi-Directional Amplifier	Standard #:	2.4.1
	Date Adopted:	##/##/####
	Date Reviewed:	
	Version:	1.0

1. Purpose or Objective

This standard outlines requirements and procedures to install and use a Bi-Directional Amplifier (BDA) to amplify frequencies used on the Iowa Statewide Interoperable Communications System. Any customer or vendor installing a BDA on ISICS must also refer to FCC rules, Fire Codes, and local building codes to ensure compliance.

2. Technical Background

• Capabilities

FCC Signal Booster Classifications

- Class A: Designed to retransmit signals on one or more specific channels. Also known as a “channelized” BDA.
- Class B: Designed to retransmit any signals within a wide frequency band. Also known as a “wideband” BDA.

Class B Signal Booster Registration

- Class B: The FCC requires that both new and existing Class B signal boosters (wideband BDA’s) be registered through the FCC Signal Booster Registration website at:www.fcc.gov/signal-boosters/registration. Any Class B signal boosters not registered after Nov. 1, 2014 will be subject to FCC enforcement action.

Signal Booster Technical Requirements

- The Signal boosters must be capable of amplifying APCO Project 25 signals.
- Signal boosters must be capable of amplifying 700 MHz Public Safety Narrowband frequencies (763-775 MHz / 793-805 MHz).

- Signal boosters must be capable of amplifying 800 MHz NPSPAC Band, 800 MHz non-NPSPAC Public Safety/BILT/Non-Cellular SMR Band, 800 MHz Expansion Band, and 800 MHz Guard Band frequencies (806-817 MHz / 851- 862 MHz).
- Signal boosters must comply with all applicable fire and electrical codes.
- For all BDA's that are operating on the ISICS system, Fire Code Officials are not permitted to waive the hardening requirements or the battery backup requirements of the Fire Code.
- It is recommended to keep the number of BDA's in a close area to a minimum, to mitigate the possibility of interference.

▪ **Constraints**

Licensee Consent is Required – Rule 90.219

- The FCC requires that non-licensees who seek to operate signal boosters must obtain the consent of the licensee[s] whose signals they intend to amplify. Consent will be provided as a Retransmission Authorization, which the FCC requires be kept on file for presentation upon request of the FCC or licensees.

3. Operational Context

To ensure the effective deployment and management of BDA systems to support reliable wireless communication and enhance overall operational efficiency and safety, ISICSB recommends the following are fully considered during the implementation of a BDA.

Facility Overview:

Analysis of area where the BDA system will be installed, including its size, layout, and any structural characteristics that may impact wireless signal propagation.

Communications Requirements:

Specific communication needs within the facility or area, including voice communication, data transmission, and emergency response coordination.

Consider the types of wireless devices and systems used, such as two-way radios, cellular phones, Wi-Fi networks, and public safety communication systems.

Coverage Areas:

Define the areas within the facility or site where reliable wireless coverage is required, such as building floors, underground levels, remote areas, and outdoor spaces.

Determine the desired signal strength and coverage parameters for each area based on operational requirements and user needs.

BDA System Design:

Specify the design and configuration of the BDA system, including the number and placement of amplifiers, antennas, and other components.

Ensure that the BDA system is compatible with existing communication infrastructure and regulatory requirements, such as FCC guidelines for signal amplification.

Operational Procedures:

Outline procedures for the installation, testing, and maintenance of the BDA system, including regular inspections, performance monitoring, and troubleshooting protocols.

Establish guidelines for system configuration, software updates, and firmware upgrades to ensure optimal performance and reliability.

Emergency Response Integration:

Integrate the BDA system with existing emergency response protocols and procedures to facilitate effective communication during critical incidents and emergencies.

Provide training and guidance to personnel on the use of the BDA system during emergency situations, including evacuation procedures and communication protocols.

Regulatory Compliance:

Ensure that the BDA system complies with relevant regulatory requirements, standards, and codes, such as NFPA (National Fire Protection Association) standards and local building codes. Obtain necessary permits and approvals for the installation and operation of the BDA system from regulatory authorities.

Documentation and Record-Keeping:

Maintain accurate documentation of the BDA system, including design plans, installation records, test reports, and maintenance logs. Keep records of system performance, signal strength measurements, and any modifications or upgrades made to the BDA system over time.

Security and Access Control:

Implement security measures to protect the integrity and confidentiality of the BDA system, including access controls, encryption, and intrusion detection mechanisms. Restrict access to sensitive areas and system components to authorized personnel only.

4. Recommended Protocol

ISICSB recommends Class A BDAs that cover the 700/ 800 MHz frequency bands.

Installation of a BDA for the purpose of amplifying frequencies over the ISICS platform will require a completed BDA installation notification form submitted to the ISICS System Administrator for review.