RATH® by AVIRE

Installation Manual

Public Safety DAS

SAFE-1050

Contents

WARNING: THIS IS NOT A CONSUMER DEVICE.

It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC licensee to operate this device.

You MUST register Class A signal boosters (as defined in 47 CFR 90.219) online at:

http://www.fcc.gov/signal-boosters/registration

Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation. This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and 2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Antenna Requirements:

The user must ensure that the installation meets FCC RF exposure limits. The minimum distance between any person and the operating antenna must be 14 inches or 35 centimeters. The antenna must be mounted on a stable, permanent structure.

Maximum effective radiated power (ERP) is five (5) watts per FCC regulations per rule part 90.219(e)(1). The FCC licensed and qualified installer must calculate the total transmitted power, taking into account the losses of the cables and splitters, etc., plus the gain of the antenna to assure compliance with the maximum exposure regulation.
Lightning protection is required on all antennas. Loss or damage as a result of lightning is not covered by the warranty.Antennas must be connected prior to turning on power to the unit.

Under Industry Canada Regulations:

This radio frequency power amplifier may only be used with the transmitter with which the amplifier has been certified by Industry Canada. The certification number for the transmitter with which this amplifier is permitted to operate is IC:22303 Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Conformément à la réglementation d'Industrie Canada, le présent amplificateur de puissance radiofréquence peut être utilisé seulement avec un émetteur avec lequel il a été certifié par Industrie Canada. Le numéro d'identification d'Industrie Canada pour l'émetteur avec lequel l'amplificateur est autorisé à fonctionner est IC : 22303 Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.

Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio (identify the device by certification number, or model number if Category II) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

About The System

Frequency Bands of Operation and RF output power control

The authorized bands of use for the SAFE-1050 Series product line include:

- 700 MHz Band: Uplink 763-775 & Downlink 799-805 MHz
- 800 MHz Band: Uplink 806-816 & Downlink 851-861 MHz

The channelizer cards and the user control via the Network Management System (NMS) determine the frequency transmitted. The manufacturer sets the general operating bands for each plug-in card. Each card can accommodate frequencies only within their designated band which is delineated in this user manual and further in the Graphical User Interface (GUI) of the web-based NMS.

The operating bands cannot be modified by the user, only the channelized frequency operating within the band can be added, deleted and set. Consult the manufacturer's data sheet and this operating manual to confirm proper operation. RF Output is controlled automatically by an ALC (automatic level control) circuitry within the cards. The user cannot set the output power to exceed the FCC limits. The user can set the output power lower than the designed maximum using the WebNMS interface integrated into the unit.

An integrated software defined radio module offers a selection of Class A filters. Up to 68 filters are available when two Digital Filter Array (DFA) modules are installed at the factory.

Note: Only factory trained and certified systems integrators are authorized to configure and manage the SAFE-1050 Booster.

Disclaimer:
The information contained in this document is assumed to be correct and current. The manufacturer is not responsible for errors or omissions and reserves the right to change specifications at any time without notice. RATH® by AVIRE assumes no responsibility for its use nor for any indirect, incidental damage or loss resulting from its use.

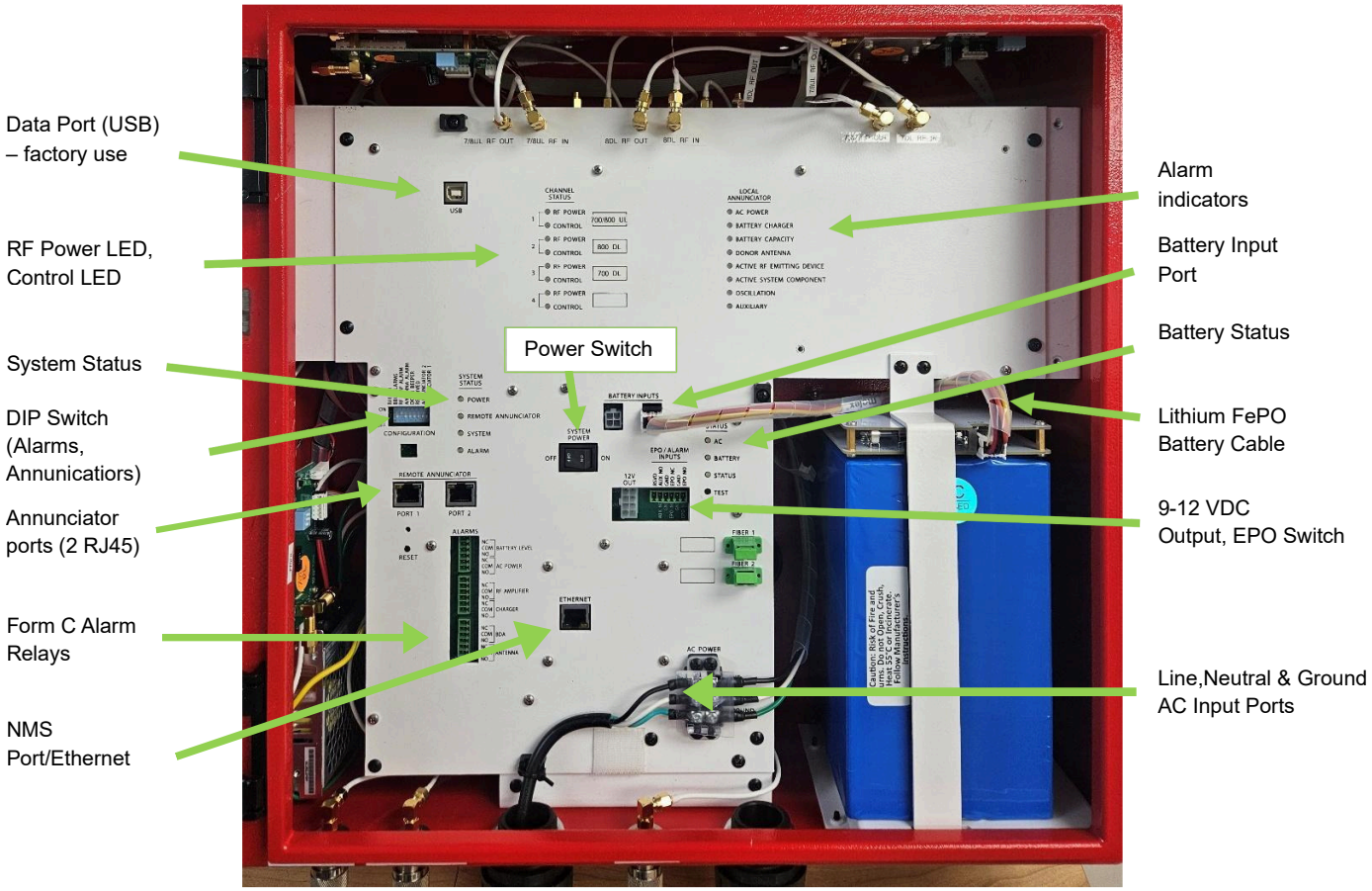
Hardware Setup

Inside the Panel

Before beginning setup, familiarize yourself with the front panel, including the battery pack, ports, wires, switches and LEDs.

Note: Your BDA will come with:

- A battery pack (sized to meet your system requirements) and battery cable.
- Three 6-pin plugs, used to connect alarm wire and end-of-line termination resistors for the fire panel.
- One USB stick with PDF manuals
- One ethernet cable to connect front panel to computer for Web NMS setup and programming.



Step 1: Startup Power & Connections

Before connecting to a power source, install the battery in the BDA enclosure. Connect the battery to the battery input port on the front panel of the BDA using the cable provided. Secure the metal bar over the battery back.

The SAFE-1050 series products operate on 120 VAC 60 Hz. An internal AC to DC power supply is installed within booster to provide power when AC is available.

Power sources which can be specified include: > 120 VAC (2 amps max)

1. Connect the system to the appropriate power source (120VAC). Follow all local electrical codes and the NEC (National Electrical Code).
    - An AC power source requires 3 connections: Line, Neutral and Ground.
    - Earth grounding the NEMA case is required. This is done through the terminal strip provided in the unit.
    - After the AC connections are secured, install the provided terminal block cover over the exposed contacts.

Note: Power consumption is directly related to the number of channels or bands and therefore the number of plug-in cards integrated in the system.

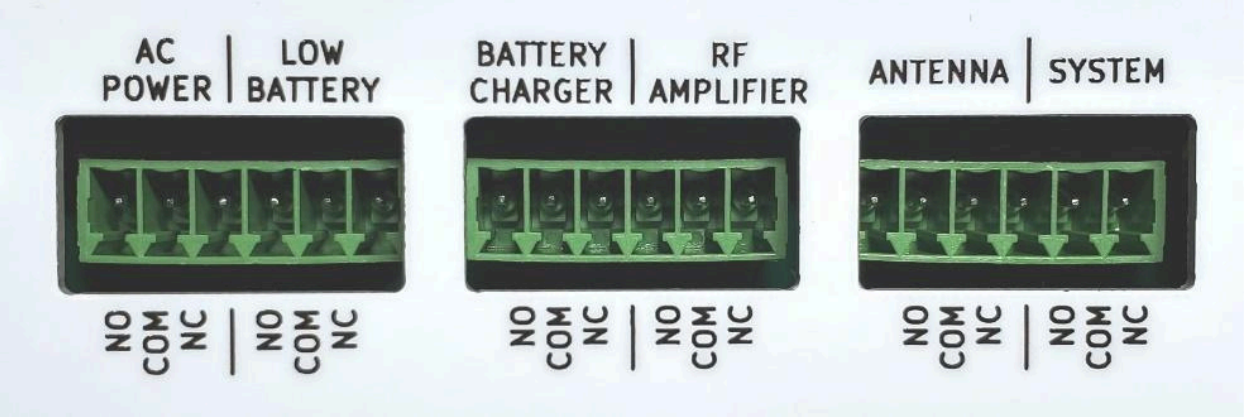
- Typical power consumption values range from 40 to 65 watts for a single BDA unit.
- An Avire applications engineer can provide the exact power consumption of your unit especially related to the backup battery requirements – whether they are 12 or 24 hours.
- When a channel is not keyed up, its internal power control circuitry reduces its power consumption to the minimum level.

2. The NEMA4 Unit case is grounded to the electrical ground terminals internally. The user must assure that the earth ground connection at the terminal strip or the grounding lug on the outside of the NEMA is properly connected to the external earth ground.

Note: All wiring shall be performed by an authorized licensed contractor in accordance with the local jurisdictions code and compliant to NEC. 6

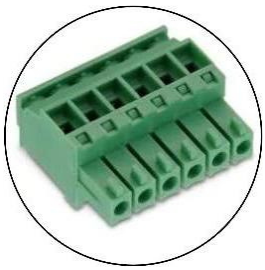
Step 2: Relay Alarm Connector Wiring Pinouts & Activation

The alarm output connector on the front panel of the BDA is comprised of 18 position (3 x 6) terminal blocks (shown here horizontally, may appear vertically on front panel).



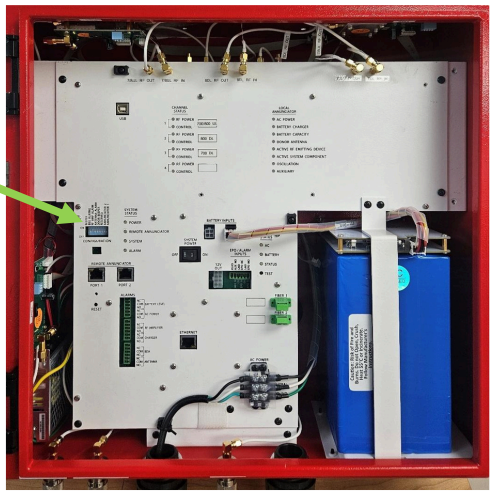
Each alarm is a Form C Relay output. The pinout provides 3 ports for each alarm that are Normally Closed (NC), Common (COM), and Normally Open (NO).

1. Insert an alarm wire and EOL resistor (as required) into one of three 6 pin plugs provided (as seen in the inset photo).
2. Then using a small screwdriver, tighten the wire into place. Each position accepts a wire size of 18 to 26 gauge with room for a EOL resistor.
3. Connect 2 wires to the Common and one of the other ports depending on whether the fire panel requires normally open or normally closed relay inputs.



Note: The BDA or System Alarm output relay is a catch-all summary alarm output that triggers along with any of the other alarm notifications. Therefore, it can be used as a single summary connection to the fire panel.

The 8-pin input DC power & alarm connector, also known as the DIP switch, is also found on the front panel and is used to activate the alarms.



1. Once wiring is complete, the alarms are activated by turning all the switches in the first 5 positions on the DIP switch to the “up” position.
2. They can be disabled by turning the switches to the down position.

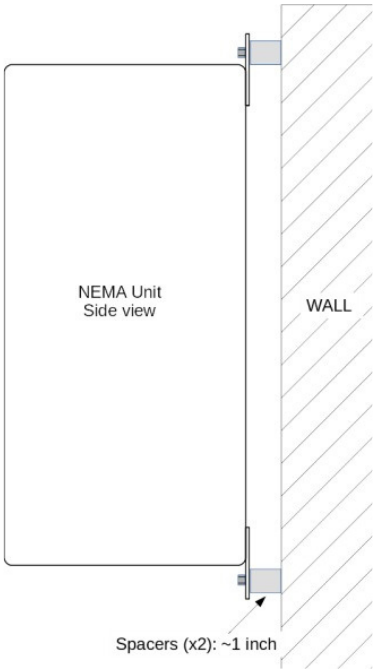
Step 3: Mounting

When mounting the BDA on the wall, it is critical to provide spacers between the unit and the wall. A one-inch space is appropriate to allow for good air flow.

One inch punched square tube can be used as a spacer between the NEMA unit and the wall.

Four ¼ inch LAG screws are to be used to mount the NEMA unit to ½ plywood.

Note: For pluggable equipment, the socket-outlet shall be easily accessible. Proper strain relief is required on all electrical connections to the unit.

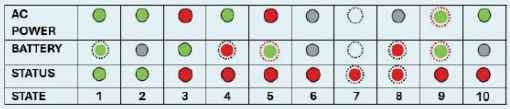


Step 4: Power On The Unit

The BDA enclosures are grounded to the electrical ground terminals internally. The user must ensure that the earth ground connection at the terminal strip or the grounding lug on the outside of the enclosure is properly connected to the external earth ground.

1. Ground all units properly via the DC or AC input terminal.
2. Connect all units with power.
3. Turn on the BDA using the system power switch on the front panel.
4. Verify the Battery LED status indicators should be in State 1 upon initial power-up. See “LED Indicators” below.
5. Confirm the frequencies are set properly via the Web NMS (see next section).

LED Indicators



Grey Circle indicates LED off.

White Dotted Circle indicates LED may flash red or green depending on current state when alarm occurred.

Dashed Circle indicates flashing LED.

State Descriptions

1. AC on, battery charging/balancing.
2. AC on, battery charged.
3. AC off, battery powered.
4. AC on, charger failure (not connected).
5. AC off, low battery voltage: (slow red/green flash).
6. External AUX alarm active.
7. External EPO engaged.
8. Battery over current.
9. Battery error: fast flashing (battery and status LEDs indicate blown fuse or cell out of range).

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