HONBDA-X

Digital Signal Booster with Battery Backup

User and Installation Manual

Document LS10396-000FX-E Rev: A
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Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

Alarm Signaling Communications:

- **IP connections** rely on available bandwidth, which could be limited if the network is shared by multiple users or if ISP policies impose restrictions on the amount of data transmitted. Service packages must be carefully chosen to ensure that alarm signals will always have available bandwidth. Outages by the ISP for maintenance and upgrades may also inhibit alarm signals. For added protection, a backup cellular connection is recommended.
- **Cellular connections** rely on a strong signal. Signal strength can be adversely affected by the network coverage of the cellular carrier, objects and structural barriers at the installation location. Utilize a cellular carrier that has reliable network coverage where the alarm system is installed. For added protection, utilize an external antenna to boost the signal.
- **Telephone lines** needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup alarm signaling connections are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

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Software Downloads

In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

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Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

This symbol (shown left) on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, contact your local authorities or dealer and ask for the correct method of disposal.

Electrical and electronic equipment contains materials, parts and substances, which can be dangerous to the environment and harmful to human health if the waste of electrical and electronic equipment (WEEE) is not disposed of correctly.

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Section 1: Introduction

1.1 About This Manual

This manual describes the installation, commissioning, operation, and maintenance of the HONBDA-X signal booster with battery bakup. The first part of the manual describes the hardware and the second part describes the software.

The hardware and software mentioned in this manual are subject to continuous development and improvement. Consequently, there may be minor discrepancies between the information in the manual and the performance and design of the hardware and software. Specifications, dimensions, and other statements mentioned in this manual are subject to change without notice. This manual or parts of it may not be reproduced without the written permission of Fiplex.

1.2 Abbreviations

Table 1.1 lists the abbreviations and descriptions used in this manual.

AGC	Automatic Gain Control
BS	Base Station, BS antenna = towards the base station
BW	Bandwidth
DC	Direct Current
DL	Downlink signal direction (from base station via Signal Booster / Master / Remote to mobile station)
DPLX	Duplex filter
EEPROM	Electrical Erasable Programmable Read Only Memory
ETSI	European Telecommunications Standard Institute
FCS	Fiplex Control Software
FPGA	Field Programmable Gate Array
HW	Hardware
LED	Light Emitting Diode
LNA	Low Noise Amplifier, uplink and downlink
MS	Mobile Station, MS antenna = towards the mobile station
OL	Overload
OMS	Operation and Maintenance System
PA	Power Amplifier
pFOMS	Portable Fiplex Operation and Maintenance Software
PS	Power Supply
RF	Radio Frequency
RSSI	Received Signal Strength Indication
SW	Software
UL	Uplink signal direction (from mobile station via Signal Booster / Master / Remote to base station)
WEEE	Waste of Electric and Electronic Equipment

Table 1.1 Abbreviations

1.3 Safety Guidelines

The general safety information in this manual applies to both operation and service personnel. Specific warnings and cautions are located in the applicable sections of the manual but may not appear in this summary. Failure to comply with these precautions or specific warnings violates safety standards of design, manufacture, and intended use of equipment. Fiplex assumes no liability for failure to comply with these requirements:

- **Grounding -** These signal boosters must always be operated with the ground wire properly connected. The external main earth terminal shall be connected to the building's main earth.
- **Explosive Atmosphere -** To avoid explosion or fire, do not operate this product in the presence of flammable gases or fumes.
- **Lightning Danger -** Do not install or adjust these units during an electrical storm.
- **Avoid explosive atmospheres -** To avoid explosion or fire, do not operate this product in the presence of flammable gases or fumes.
- **Fuses -** Fuses are to be replaced only by authorized factory trained personnel or Fiplex certified installers.

WARNING: HIGH VOLTAGES PRESENT

THERE ARE NO USER SERVICEABLE PARTS INSIDE THIS UNIT. HAZARDOUS VOLTAGES ARE PRESENT WHEN THE COVER IS REMOVED. OPEN THE CHASSIS ONLY TO PERFORM NECESSARY INSTALLATION TASKS DESCRIBED IN THIS MANUAL, AND CONFINE ACTIVITIES TO THOSE SPECIFIED IN THIS MANUAL. OPENING INTERNAL MODULES OR MODIFYING INTERNAL WIRING MAY VOID YOUR WARRANTY.

CAUTION: MODIFICATIONS VOID FCC USAGE

CHANGES AND MODIFICATIONS NOT EXPRESSLY APPROVED BY FIPLEX CAN VOID YOUR AUTHORITY TO OPERATE THIS EQUIPMENT UNDER THE FEDERAL COMMUNICATION COMMISSION'S RULES.

1.4 Security

The manufacturer requires the installer use ethernet functions behind a firewall that has sufficient security features in place and ensure that their networks are safe from internal and external threats. While using the Web Server interface, use a VPN connection for additional security.

1.5 Patent Pending Technology

The HONBDA-X Signal Booster with Backup Battery uses automatic calibration to configure the device with reduced uplink noise from the BDA and provide a "No Noise" system using:

- the minimum uplink power needed
- the minimum uplink gain needed
- the maximum uplink squelch threshold needed

1.6 FCC Compliance

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.

The antenna gain and passive loss between the signal boosters used with this device should result in 0dBi or less and all persons should maintain a minimum separation of 8.7" (22 cm) for general uncontrolled exposure and general controlled exposure.

The following label must be placed on the unit.

Part 90 Signal Boosters. This is a 90.219 CLASS A DEVICE.
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 B signal boosters (as defined in 47 CFR 90.219) online at **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.

If the user selects a filter with a bandwidth greater than 75KHz, then the following label should be applied to the unit.

Part 90 Signal Boosters. This is a 90.219 CLASS B DEVICE.
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 B signal boosters (as defined in 47 CFR 90.219) online at **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.

Class B broadband operations that include the ESMR frequency bands 817-824 MHz and 862-869 MHz are permitted only when installed indoors due to section 90.219(d)(7) of the FCC rules, which says: "Except for distributed antenna systems (DAS) installed in buildings, the passband of a [part 90] Class B booster should not encompass both commercial services (such as ESMR and Cellular Radiotelephone) and part 90 Land Mobile and Public Safety Services."

1.7 IC Compliance

In compliance with RSS 131 Issue 2, the following ratings are allowed.

- Nominal passband gain: 85 dB max
- Rated mean output power: up to +33 dBm
- Input and output impedances: 50 ohms

The manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating must be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is done by the input power or gain reduction and not done by an attenuator at the output of the device.

RF Exposure Statement for ISED: “This device complies with Health Canada’s Safety Code. The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada’s website at https://www.hc-sc.gc.ca/rpb.

The antenna(s) used for this transmitter must be installed to provide a separation of at least 18” (45 cm) in DL and 18” (45 cm) in UL from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. Changes or modifications not expressly approved by the party responsible for compliance could void the installer’s authority to operate the equipment.

Section 2: Product Description

The HONBDA-X is an FPGA-based PS700 and PS800 Dual Band Digital Signal Booster with its own backup battery that transmits in the downlink frequencies of 758-775MHz & 851-869MHz and receives in the uplink frequencies 788-805MHz & 806-824MHz for use in the United States.

The integrated battery backup can provide 24 hours of backup power.

This device is a dual band channel selective Public Safety 700 and Public Safety 800 Dual Band Digital Signal Booster that operates in the PS700 and PS800 bands.

Each band has a separate intermediate filtering. The intermediate filtering is done using FPGA based Digital Signal Processing that is capable of handling 32 filters in uplink PS700, 32 filters in downlink PS700, 32 filters in uplink PS800 and 32 filters in downlink PS800, making a total count of 124 filters. Additionally, this unit is compatible with the PS700 Band 14.

This signal booster has a downlink and uplink composite output power as described as follows:

- 33 dBm in 700 MHz DL
- 33 dBm in 800 MHz DL
- 24 dBm in 700 MHz UL
- 24 dBm in 800 MHz UL

The integrated backup battery allows BDA alarms to be shown on the front panel annunciator with LED outputs for:

- Normal AC Power
- Loss of Normal AC Power
- Battery Capacity < 30%
- Battery Charger Fail
- Donor Antenna Disconnected
- Donor Antenna Malfunction
- RF Emitter Fail
- System Component Fail

Additionally, alarms can be connected to a remote annunciator with a dedicated ethernet cable using RJ45 connectors.

This device has a buzzer that will sound when an alarm is detected. A Mute button is located inside the unit to silence audible alarms.

To test the functionality of the dry contact outputs and the panel LEDs, press and hold the MUTE button for more than 10 seconds.

This device has a heavy duty, NEMA 4 rated cabinet for outdoor use which is designed to be wall mounted.

2.1 Cabinet

Figure 2.1 shows the cabinet dimensions and Figure 2.2 shows the cabinet features..

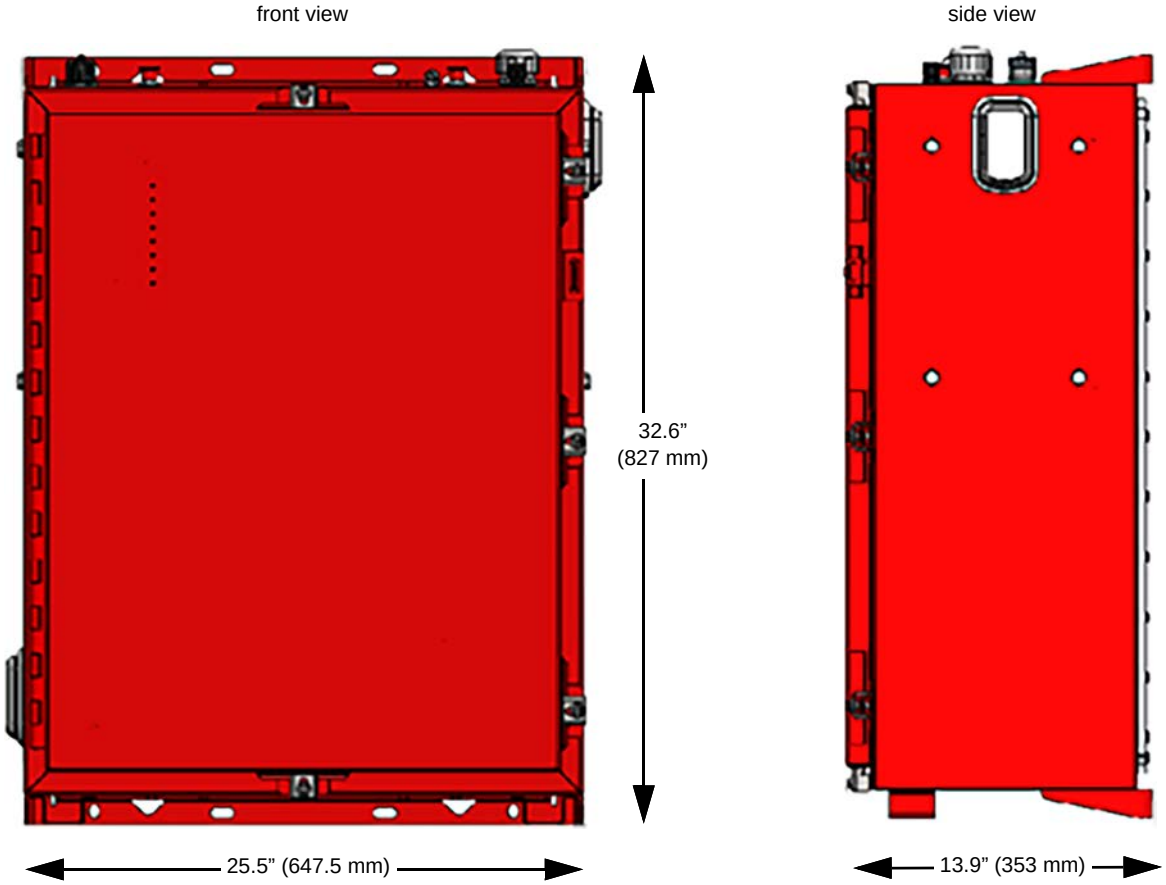


Figure 2.1 Cabinet Dimensions

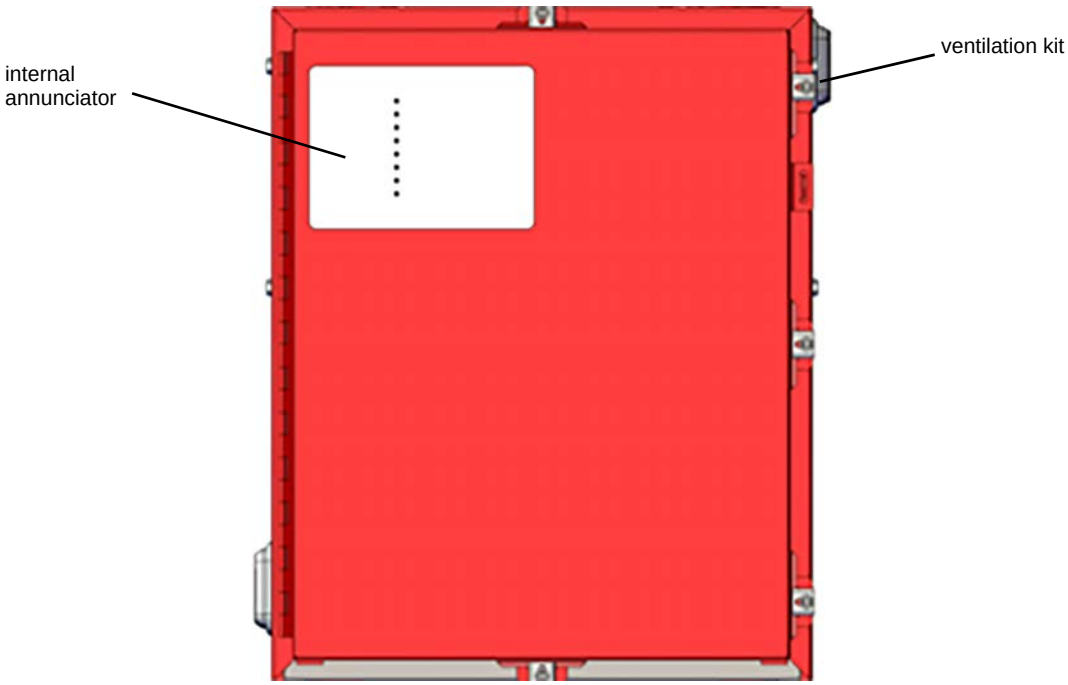


Figure 2.2 Cabinet Features

Figure 2.3 shows the cabinet connectors.

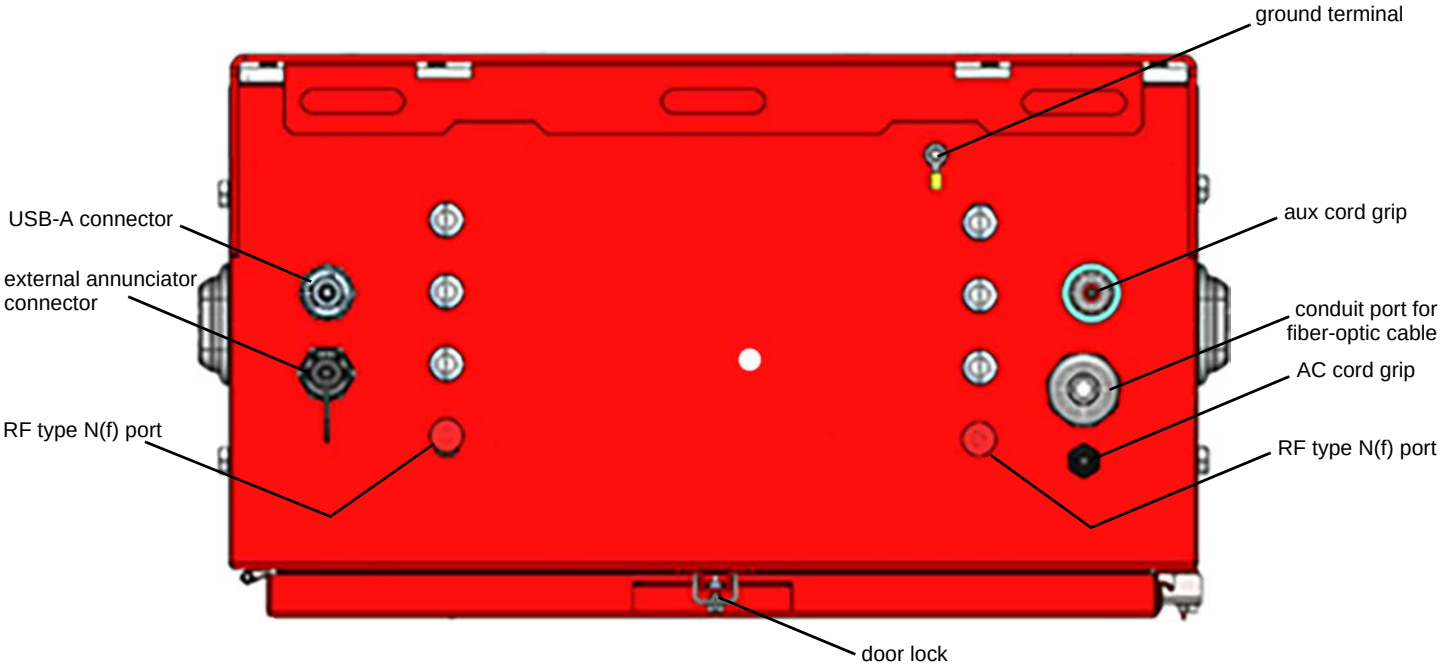


Figure 2.3 Cabinet Connector Locations

2.2 Specifications

2.2.1 Power

The nominal main power input voltage is 120VAC, 9A, 60Hz.

2.2.2 Mechanical

Parameters	Specifications	Notes
Size	32.6” x 25.5” x 13.9” (827 x 647.5 x 353 mm)	
Weight	Approx 159 lbs (72 kg) without batteries	
Connectors	Donor/Coverage Antenna Ports: N (f)	Mating Male Connector Torque 3.7 ft./lbs
	AC Power in	Refer to wiring Instructions in Section 3.
	Frame Ground	Two Lug Ground
	USB Cable	Local Management
Mounting Type	Wall	Refer to mounting instructions in Section 3.
Heat Dissipation	Natural Convection	
Finish	Red paint	

Table 2.1 Mechanical Specifications

2.2.3 Environmental

- Operating Temperature: -13º F to +131º F (-25º C to +55ºC) (ambient)
- Storage Temperature: -40ºF to + 140ªF (-40º C to +60ºC) (ambient)
- Operating Humidity: 5% to 95%
- Environmental: NEMA4 compliant

2.2.4 RF Connectors

- Max RF Input with no damage: +5dBm
- Max RF Output Power: 27dBm
- Frequency Range: Narrow version:
  – DL: 758-775MHz & 851-861MHz
  – UL: 788-805MHz & 806-816MHz
- Frequency Range: Wide Version:
  – DL: 758-776MHz & 851-869MHz
  – UL: 788-806MHz & 806-824MHz

Section 3: Installation and Wiring

3.1 Installation Guidelines

The following guidelines should be carefully observed for all installations.

- The unit shall be installed by authorized factory-trained personnel only.
- The device shall be installed in an access restricted location.
- All lines shall remain internal to the building. Only the antenna may be routed outdoors.
- The device must be installed in a vertical orientation (connectors on the top).
- Inadequate isolation between the outside and inside antennas may cause regenerative feedback in the system. This feedback can cause the amplifier to emit a continuous signal at maximum amplitude, and, in some cases, interfere with normal operation of the donor site.
- The signal booster must be connected to ground for protection.
- Fiplex recommends that installers not wear jewelry or metal accessories when installing equipment.
- Do not place cables or tools that may damage the signal booster in the proximity.
- Check installation sites for hazardous conditions such as water covered floors or badly worn/damaged cables prior to installation.
- The lifespan and performance of the signal booster may be reduced if the unit is operating outside its nominal temperature range.
- Turn power to the signal booster off when connecting or disconnecting cables.

Careful considerations of the layout and placement of the system is imperative to minimize the possibilities and to minimize the amount of signal leaking from the building.

- Do not disassemble the device.
- All secondary wiring shall be securely routed and separate from any primary wiring.

The device is required to comply with the following Building and Installation Codes:

- Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, NFPA 1221
- UL Standard for Safety for In-building Two-Way Emergency Radio Communication Enhancement Systems, UL 2524
- National Fire Code NFPA 1
- National Life Safety Code, NFPA 101

WARNING: RISK OF PERSONAL INJURY

REFER TO SAFETY GUIDELINES FOR PROPER ANTENNA SELECTION AND INSTALLATION. TO AVOID SERIOUS INJURIES, DEATH, AND/OR DAMAGE TO THE DEVICE, DO NOT INSTALL DONOR OR SERVER ANTENNAS NEAR OVERHEAD POWER LINES OR HIGH-POWER COMPONENTS. ALLOW ENOUGH DISTANCE SO THAT FALLING ANTENNAS WILL NOT COME IN CONTACT WITH THOSE INSTALLATIONS.

WARNING: RISK OF ELECTRICAL SHOCK

ELECTRIC SHOCK MAY OCCUR IF THE SIGNAL BOOSTER IS INSTALLED IN CLOSE PROXIMITY TO WATER.

CAUTION: RISK OF EQUIPMENT DAMAGE

AMPLIFIER OR HANDSET DAMAGE MAY OCCUR IF A HANDSET IS CONNECTED DIRECTLY TO THE SIGN OF BOOSTER OR TO THE COAX CABLE THAT LEADS TO THE SIGNAL BOOSTER.

WARNING: RISK OF RF EXPOSURE

CLOSE PROXIMITY TO THE DONOR OR SERVER ANTENNAS WITH THE SIGNAL BOOSTER IN OPERATION MAY EXPOSE USERS OR INSTALLERS TO RF FIELDS THAT EXCEED THE FCC LIMITS FOR HUMAN EXPOSURE. TURN POWER TO THE SIGNAL BOOSTER OFF WHEN CONNECTING OR DISCONNECTING CABLES.

3.2 Signal Booster Mounting Site Criteria

This device is designed for outdoor usage with a weatherproof outdoor NEMA4 cabinet and can be mounted without any kind of shelter from rain, snow, or hail. To improve the reliability, the manufacturer recommends the installer mount this device on a site with shelter from the elements. It is not recommended to operate the signal booster under bad weather conditions, such as:

- Intense rainfall, snowfall, or hail
- Storms or high winds
- Extremely low or high temperatures
- High humidity

NOTE: The device is designed to be installed vertically with batteries. DO NOT lay the equipment down once the batteries are installed.

3.3 Mounting the Cabinet

To mount the unit, use a maximum screw diameter 0.375” (8.07 mm) recommended length: 3" (76.2 mm). The recommended fasteners are steel stud anchors for concrete.

1. Mark and drill pilot holes into the wall based on the dimensions and locations shown in Figure 3.1 below.
2. Secure with four 0.375” x 3.0” steel stud anchors.
3. Ensure cabinet is held tight to wall.

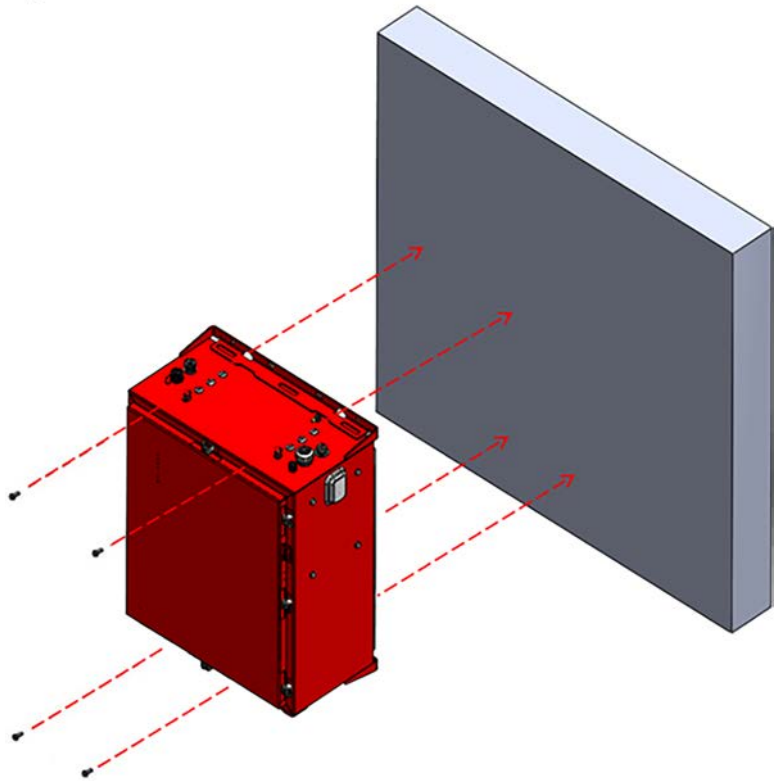


Figure 3.1 Mounting Hole Locations

3.4 Preparing to Wire

Ensure all breakers are OFF with switches being in the downward position.

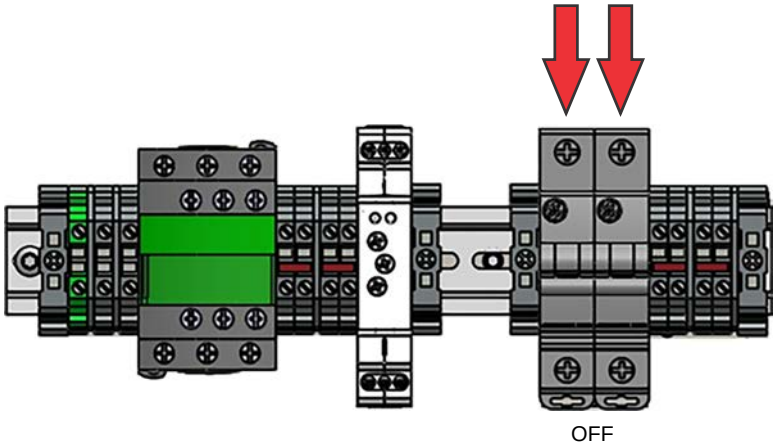


Figure 3.2 Breakers in Off Position

3.5 Operation Without Batteries

This system is not designed to be used in a normal operation without batteries. However, there may be instances where special tests need to be performed prior to the installation of batteries. To operate the system temporarily without batteries, lock the integrated Emergency Power Off (EPO) relay with a plastic device as shown in Figure 3.3 and Figure 3.4 below.

CAUTION: TEMPORARY OPERATION

THIS PROCEDURE IS NOT FOR PERMANENT OPERATION. IF THE INSTALLER NEEDS TO LEAVE THE SITE OR OPERATE THE DEVICE WITHOUT BATTERIES PERMANENTLY, CONTACT FIPLEX BY HONEYWELL TECHNICAL SUPPORT FOR ASSISTANCE.

1. Remove the contact cover.
2. Push the button and lock it with a plastic safety lock.

Figure 3.3 Remove Cover

Figure 3.4 Insert Plastic Lock

3.6 Earth Ground

Connect AC main earth ground to the ground terminal.

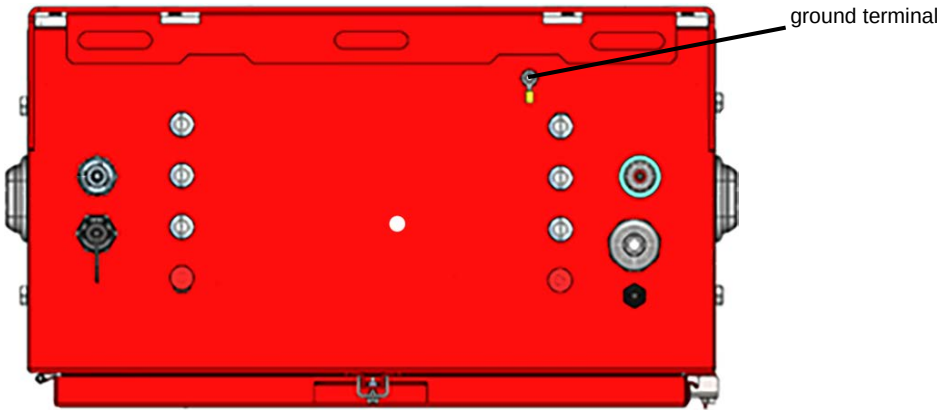


Figure 3.5 Connect Earth Ground

3.7 Batteries

CAUTION: RISK OF EQUIPMENT DAMAGE

BEFORE INSTALLING BATTERIES, ENSURE THAT

- AC POWER IS DISCONNECTED
- BOTH BATTERY BREAKERS ARE OFF (DOWNWARD POSITION)
- BATTERY FUSES ARE REMOVED

3. Mount the first battery in the left side cabinet with the negative (-) terminal on top as shown below.
4. Find the red wire attached to the PCB marked “Batt 1 +++” and fasten to the positive terminal on the battery.

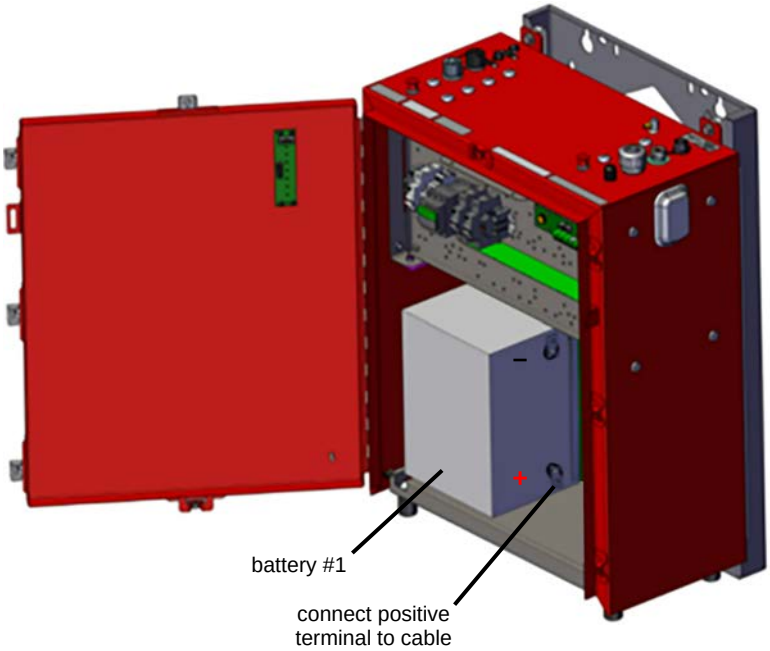


Figure 3.6 Install Battery #1

5. In the hardware kit, locate the temperature sensor wire and mounting plate. Secure the temperature sensor to the metal plate.
6. Install the end of the temperature sensor wire to the PCB as shown below.
7. Identify the black wire inside the cabinet labeled, “Batt 1 ---”, and secure the temperature sensor mounting plate to battery #1 at the negative terminal.

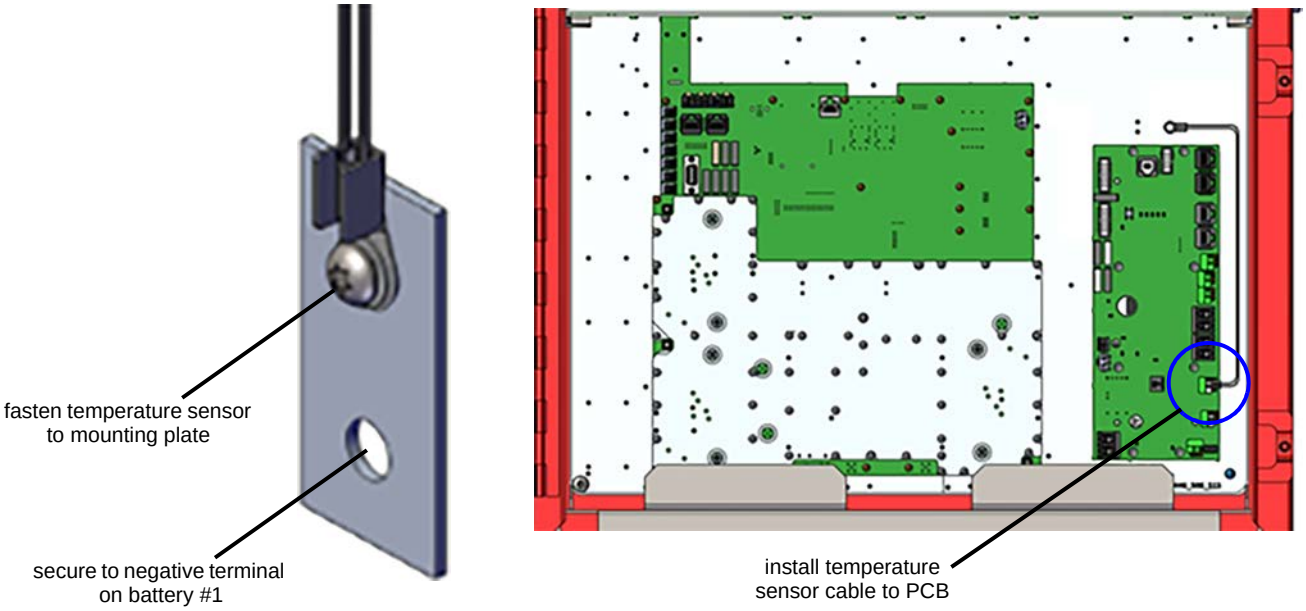


Figure 3.7 Install Temperature Sensor

8. Install battery #2 with the positive terminal at the top.
9. Locate the red wire inside the cabinet labeled “Batt 2 +++” and fasten to the positive terminal.
10. Locate the black wire inside the cabinet labeled “Batt 2 ---” and fasten to the negative terminal.

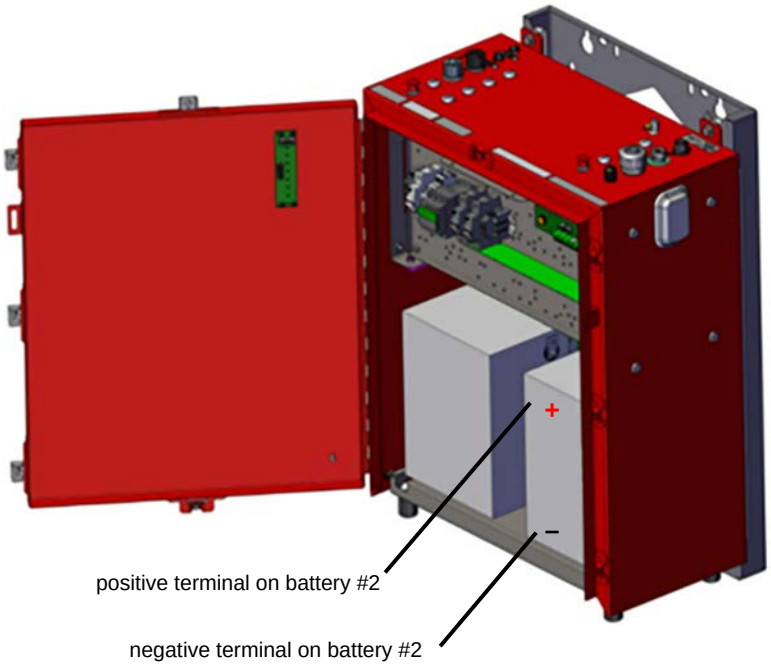


Figure 3.8 Install Battery #2

3.8 Fuses

Install the provided 10A, 80V fuses into the fuse holders on each positive (red) battery cable. The fuses will click into place.

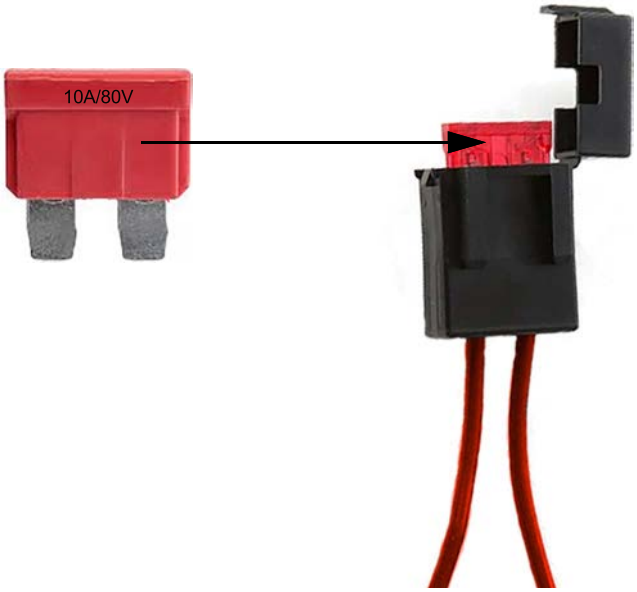


Figure 3.1 Install Fuses

3.9 AC Power

Connect AC power to the terminals on the top left of the board. Route the wires through the cabinet as shown below. Electrical installation must provide differential and thermo-magnetic breaker elements according to international electric safety regulations.

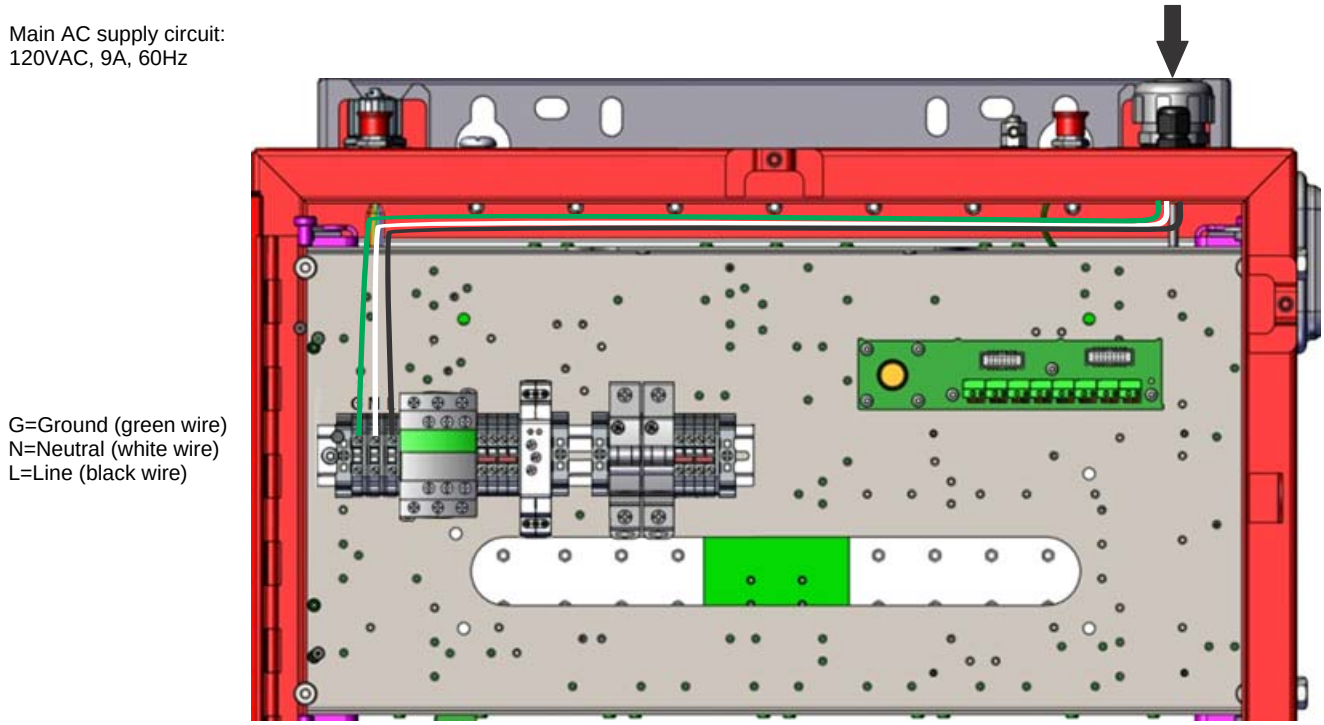


Figure 3.9 AC Wiring

3.10 Antennas

CAUTION: SURGE PROTECTION

THE ANTENNA PORTS OF THIS DEVICE SHOULD BE PROTECTED WITH A SURGE PROTECTOR THAT PROVIDES A MAXIMUM RESISTANCE OF 5.2 MOHM (INCLUDING TOLERANCE) AND MINIMUM WATTAGE RATING OF 0.5W BETWEEN THE ANTENNA PORT AND GROUND.

1. Connect the service antenna to the “To Mobile RF” port using N-type female connectors.
2. Connect the donor antenna to the “To Base RF” port using N-type female connectors.

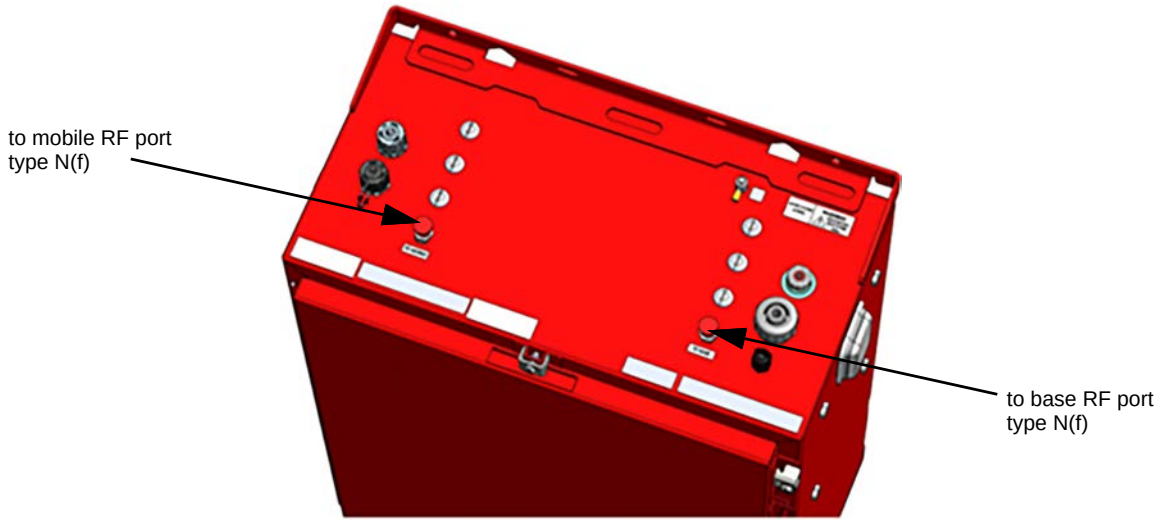


Figure 3.10 Connect Antennas

3.11 Installing a Multi-Monitor Module

Each HONBDA-X has a space to mount a multi-monitor module. The booster and the module come with all hardware needed to mount and wire the module.

1. Install standoffs into the locations shown. Secure the module using the hardware provided.

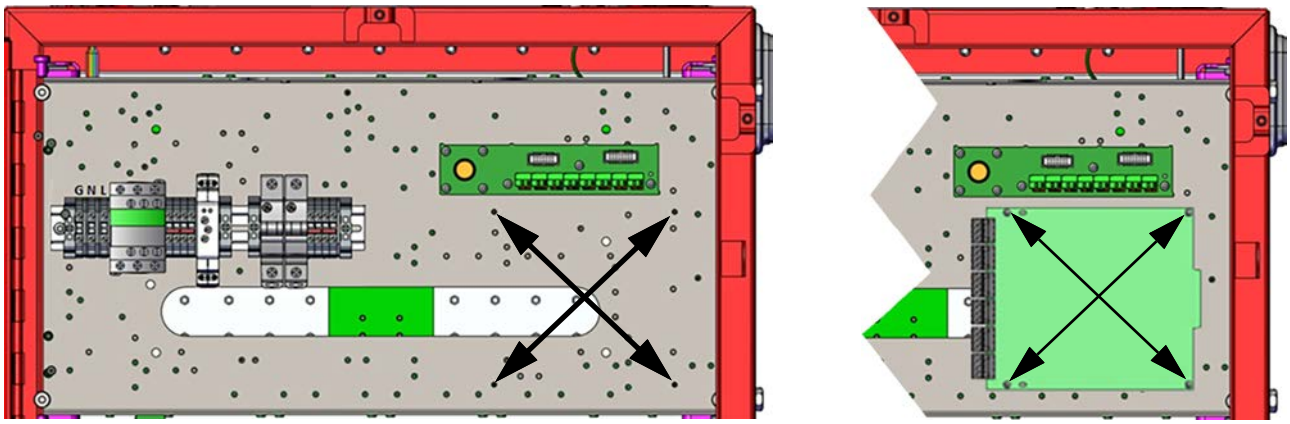
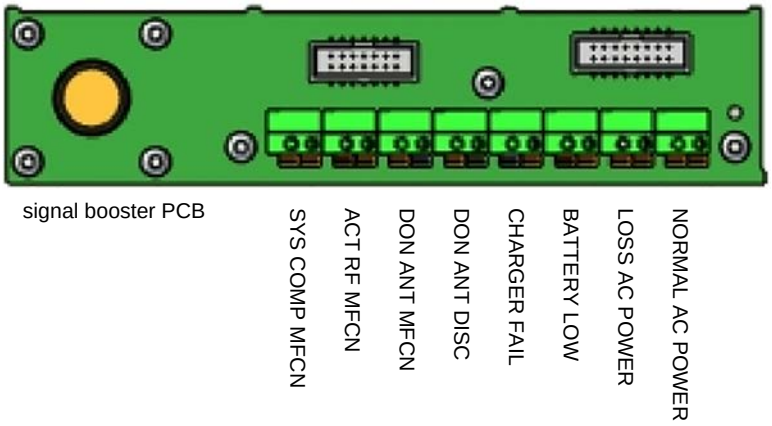
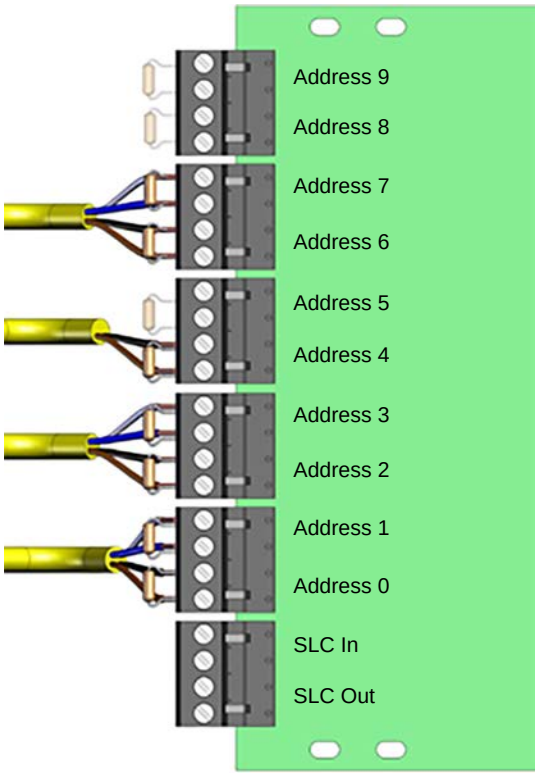


Figure 3.11 Install a Multi-Monitor Module

2. Cut the lugs off of three of the 47kΩ resistors that come with the multi-monitor module. Install the resistors into Addresses 5, 8, and 9 as shown below in 3.12.
3. Using the cables with pre-soldered resistors, from the hardware kit and the resistors from step 2, connect the signal booster to the multi-module as shown. Notice that the cable in Address 4 only has two wires (one resistor).





Booster	Module*
n/a (resistor only)	Address 9
n/a (resistor only)	Address 8
CHARGER FAIL	Address 7
AC POWER LOSS	Address 6
n/a (resistor only)	Address 5
DONOR ANTENNA DISCONNECTED	Address 4
BATTERY LOW	Address 3
DONOR ANTENNA MALFUCTION	Address 2
ACT RF MALFUNCTION	Address 1
SYSTEM COMPONENT MALFUNCTION	Address 0

* Every address must have a 47kΩ resistor installed.

Figure 3.12 Wiring a Multi-Monitor Module

3.12 Power On the Unit

Once all the previous steps are fully completed, turn on the device by switching the breakers to the ON position. Once these breakers are switched ON, it takes about 40 seconds to boot up. After that time, the signal booster is ready to be connected via USB cable to a computer running Fiplex Control Software (FCS) for software configuration.

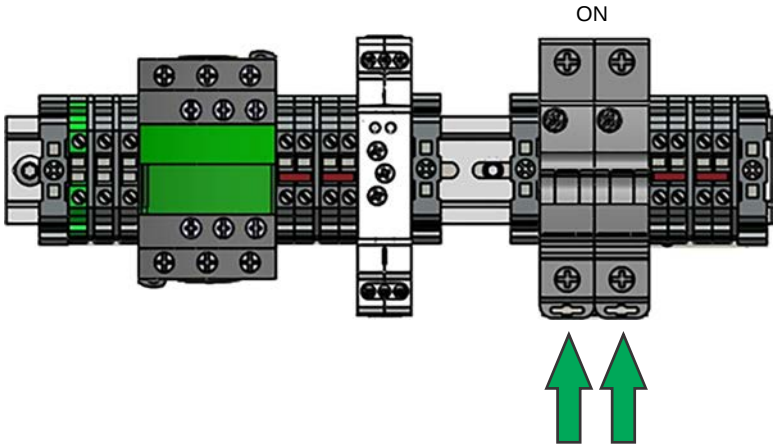


Figure 3.13 Breakers in On Position

Section 4: Fiplex Control Software (FCS)

The Fiplex Signal Booster can be fully configured and monitored in local mode on a PC running Microsoft® Windows® and a USB port. To locate FCS on the website, access the Support section on https://www.fiplex.com.

4.1 Local Software Setup - Installing the Desktop Application Using the USB Port

4.1.1 Installing FCS

1. Before connecting the USB cable between the computer and the signal booster, run the FiplexControlSoftware.msi file. The following screen will appear.

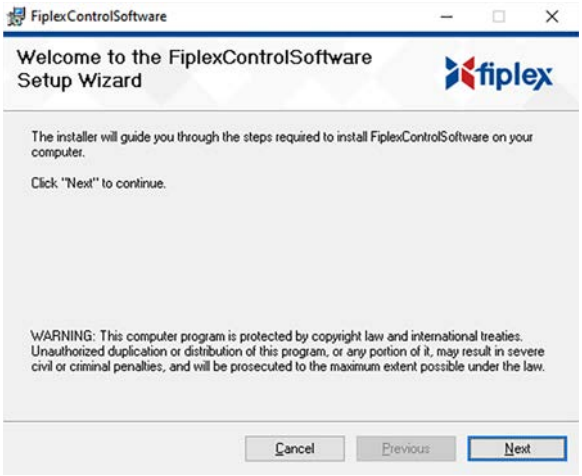


Figure 4.1 FCS Setup Wizard Screen

2. Choose the default installation path “C:\Program Files (x86)\ Fiplex Control Software”. This installation path can change based on your system configuration (32 bits or 64 bits), language and the Windows version.

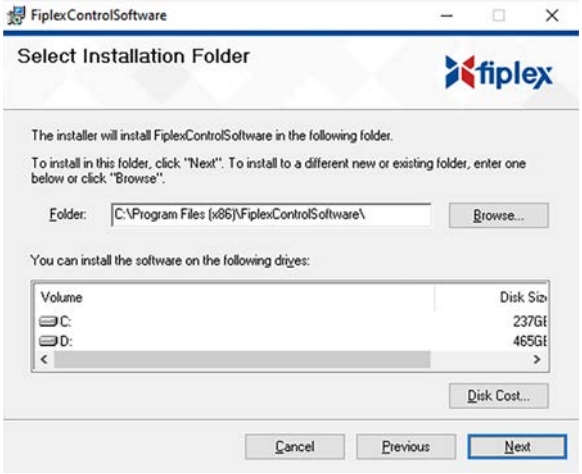


Figure 4.2 Installation Folder Screen

Figure 4.3 shows the Confirm Installation screen.

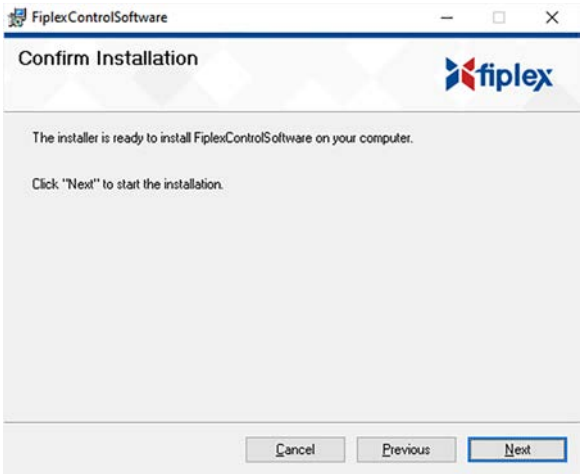


Figure 4.3 Confirm Installation Screen

3. The installation wizard will start to copy the necessary files.

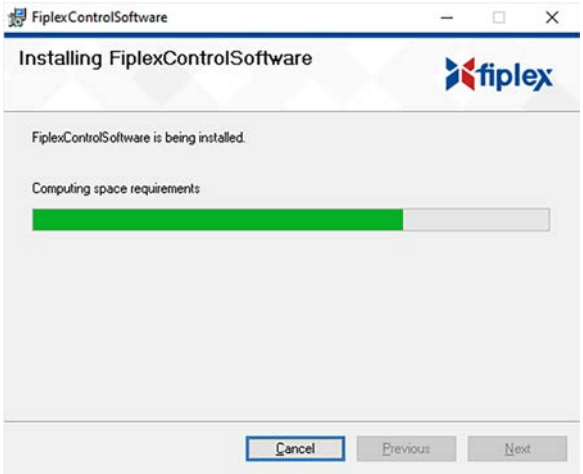


Figure 4.4 Fiplex Control Software Installation Screen

4. After the installation is completed, a shortcut appears on the desktop.

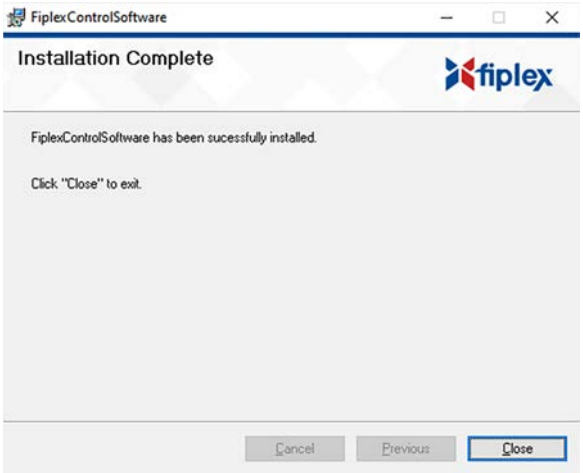


Figure 4.5 Installation Complete Screen

5. Turn OFF the signal booster.
6. Connect the USB cable between the computer and the signal booster.

   Usually, the drivers are automatically installed, but depending on the Windows version, a screen may appear looking to update the drivers. Drivers can be found in the Application folder: C:\Program Files (x86)\FiplexControlSoftware\drivers.

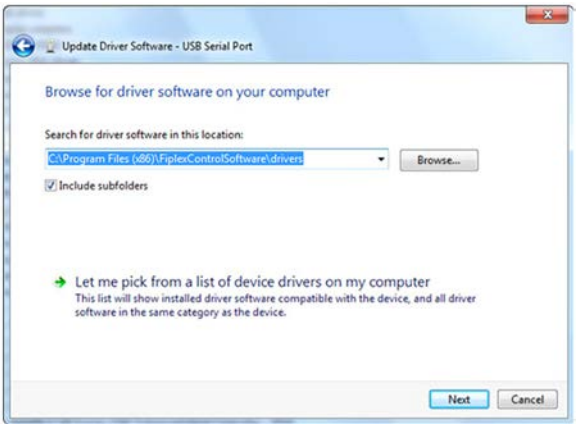


Figure 4.6 Install Drivers Screen

7. Turn ON the signal booster.

CAUTION: PROPERLY LOAD TO MOBILE/TO BASE PORTS

BE SURE THAT “TO MOBILE” AND “TO BASE” PORTS ARE PROPERLY LOADED WITH EITHER 50 OHMS DUMMY LOADS OR RADIATING SYSTEM.

8. Run FCS. The following window appears. The baud rate must be 115,200 bits per second.

Figure 4.7 FCS Screen

4.2 User Interface Controls

- **Scan Devices button:** Refreshes the available COM ports and identifies Fiplex devices.
- **Connection button:** Connects / disconnects the software from the signal booster.
- **List of available devices:** Below the two buttons is a dropdown list which shows the available COM ports.
  - Available COM ports not related to Fiplex signal boosters show its number and “Unknown device” label.
  - COM ports related to Fiplex signal boosters show a device description.
- **Embedded Web browser:** Graphical area where configuration and monitoring parameters are shown.
- **File Menu:** Contains menus to save the signal booster configuration to a file and load the configuration from the file to the signal booster.

NOTE: If the Fiplex signal booster is not turned ON, the related COM port will appear as “Unknown device”.

9. Click “Scan Devices”.

Figure 4.8 FCS Screen

The Fiplex Digital Signal Booster is shown in the list of available devices and the Connection button is enabled.

The Fiplex Signal Booster may not appear in the list if the COM port number is higher than COM16, depending on the version of Windows. The COM port number can be forced to an arbitrary number (below COM16) through the Device Manager. To change the COM number, right-click on the port and select “Properties” from the pop-up menu.

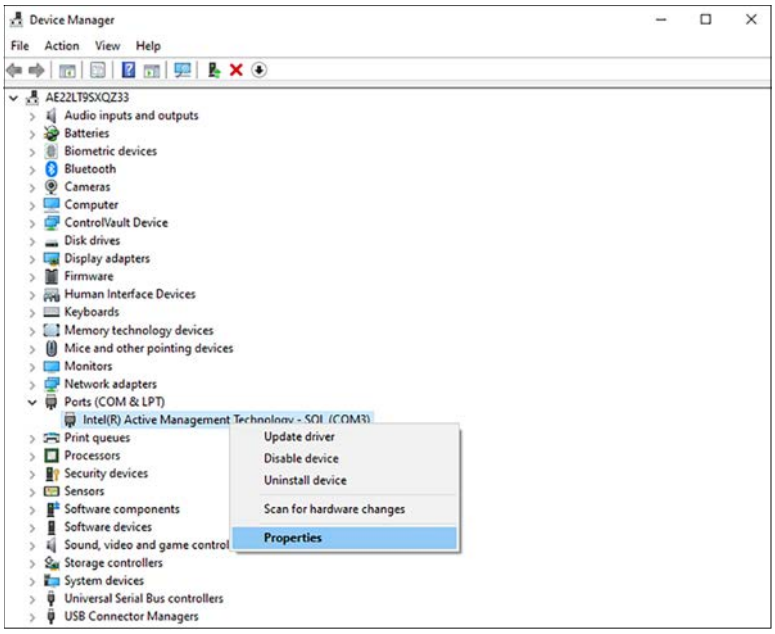


Figure 4.9 Device Manager Screen

10. On the “Port Settings” tab, click “Advanced Options”.

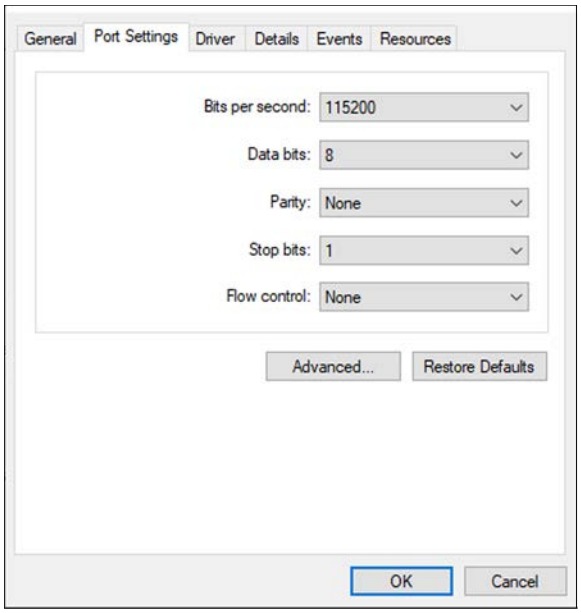


Figure 4.10 Advanced Options Screen

11. Change the COM port number from the drop-down menu and click “OK”..

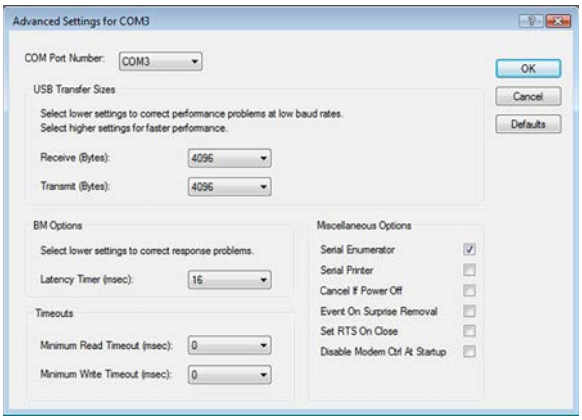


Figure 4.11 COM Port Advanced Settings Screen

12. Click “Connect” on the FCS home screen. The FCS window is automatically maximized and the web browser shows the Configuration screen.
13. After the signal booster is fully configured, disconnect the software by clicking “Disconnect”.

The application screens are described in Section 5.

If the signal booster is disconnected or turned off while the FCS is connected to the device, the software returns to the initial window. Also, if a communication problem occurs while the device is monitored, the software will return to the initial state.

Section 5: Programming

5.1 UL Programming Requirements

Table 5.1 provides the UL Programming requirements for this product.

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES			
This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for In-building Two-Way Emergency Radio Communication Enhancement Systems, UL2524 certain programming features or options must be limited to specific values or not used at all as indicated below.			
Program Feature or Option	**Permitted in UL 2524? (Y/N)**	**Possible Settings**	**Settings Permitted in UL 2524**
HW Fail Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
Antenna Isolation Alarm	Yes	Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
VSWR PS700 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3 or 4	Enabled - Assigned to Relay 3
Antenna Disconnection Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 2
UL PA Fail Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
Overload DL PS700 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
RX Power Low PS700/Donor Antenna Malfunction Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 4
DL PA Fail PS700 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
TX Power Low PS700 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
High Temperature Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
Oscillation Detection Alarm	Yes	Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
VSWR PS800 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
Overload DL PS800 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
RX Power Low PS800/Donor Antenna Malfunction Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 4
DL PA Fail PS800 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
TX Power Low PS800 Alarm	Yes	Enable/Disable - Assigned to Relay 1, 2, 3, or 4	Enabled - Assigned to Relay 3
Normal AC Power	Yes	Enable/Disable - Assigned to Relay 1, 5, 6, 7. or 8	Enabled - Assigned to Relay 1
Normal AC Power Loss	Yes	Enable/Disable - Assigned to Relay 1, 5, 6, 7. or 8	Enabled - Assigned to Relay 5
Battery Capacity Under 30%	Yes	Enable/Disable - Assigned to Relay 1, 5, 6, 7. or 8	Enabled - Assigned to Relay 7
Battery Charger Fail	Yes	Enable/Disable - Assigned to Relay 1, 5, 6, 7. or 8	Enabled - Assigned to Relay 6
System Component Fail	Yes	Enable/Disable - Assigned to Relay 1, 5, 6, 7. or 8	Enabled - Assigned to Relay 8
BBU Communication Error	Yes	Enable/Disable - Assigned to Relay 1, 5, 6, 7. or 8	Enabled - Assigned to Relay 8

Table 5.1 UL Programming Requirements

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES			
This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for In-building Two-Way Emergency Radio Communication Enhancement Systems, UL2524 certain programming features or options must be limited to specific values or not used at all as indicated below.			
Program Feature or Option	**Permitted in UL 2524? (Y/N)**	**Possible Settings**	**Settings Permitted in UL 2524**
VSWR Meter for PS700 and PS800	Yes	Select a minimum TX power for VSWR Detection / Return Loss Threshold / Alarm Sensitivity	The settings will vary from site to site: 1. For Minimum TX Power for VSWR Detection: This feature is to avoid fake alarms. Ensure the indicated “Power Forward” is above the configured “Minimum TX Power for VSWR detection” value. 2. For Return Loss Threshold: The “Return loss” measurement is indicated on the screen. This Return Loss measurement will vary when the Indoor antennas are disconnected. Configure the Return Loss Threshold to allow for an alarm to appear when the indoor antenna is disconnected. 3. For Alarm Sensitivity: This configuration is to avoid the an alarm to occur when a detection is too close form the threshold. TO VERIFY THE PROPER CONFIGURATION OF THIS ALARM, CONNECT AND DISCONNECT THE INDOOR ANTENNA RF PORT (TO MOBILE PORT) AND VERIFY THAT RELAY 3 IS INDICATING THE ALARM UPON DISCONNECTION.
Antenna Disconnect Alarm	Yes	Select the Broadband Input Threshold for this alarm	To properly configure this parameter, compare the measured Broadband Input Level with and without the donor antenna connected to the “To Base” RF Port and configure the Broadband Input Threshold to be in between those two values. TO VERIFY THE PROPER CONFIGURATION OF THIS PARAMETER, DISCONNECT THE DONOR ANTENNA AND VERIFY THAT RELAY 2 INDICATES THE ALARM.
RX Low Power Alarm PS700 and PS800	Yes	Configure the DL Squelch Threshold to trigger this alarm properly.	The RX Low Power alarm is used to provide the Donor Antenna Malfunction. Configure the DL Squelch threshold on each channel below the actual power per channel measurement. TO VERIFY THE PROPER CONFIGURATION OF THIS PARAMETER, DISCONNECT THE DONOR ANTENNA AND VERIFY THAT RELAY 4 INDICATES THE ALARM.
Filter BW and Delay Selection	Yes	• 150KHz, 11.5µS • 100KHz, 13.5µS • 75KHz, 16.0µS • 62.5KHz, 18.0µS • 50KHz, 21.0µS • 37.5KHz, 25.5µS • 25KHz, 35.0µS • 12.5KHz, 61.5µS	To comply with P25 PH2 delay requirements, select ONLY the following options: • 150KHz, 11.5µS • 100KHz, 13.5µS • 75KHz, 16.0µS • 62.5KHz, 18.0µS • 50KHz, 21.0µS • 37.5KHz, 25.5µS
System Components Fail	Yes	Enabled or Disabled	Enable this alarm for all battery charger troubles.
Communication Error	Yes	Enabled or Disabled	Enable this alarm to detect communication loss between the amplifier and the backup battery.

Table 5.1 UL Programming Requirements (Continued)

5.2 Fiplex Control Software Configuration

WARNING: PROPERLY LOADED PORTS

ENSURE THAT “TO MOBILE” AND “TO BASE” PORTS ARE PROPERLY LOADED EITHER WITH 50 OHMS DUMMY LOADS OR THE RADIATING SYSTEM.

1. Turn ON the digital signal booster.
2. Connect the computer to the signal booster using a USB cable.
3. Run FCS.

   For technical support, visit www.fiplex.com/support.
4. Click “Connect” and enter the default password: **-y_>A,3<#$Rfz9:?**

   After logging in, change the password to a new, unique password through the File / Change Password menu.

   If the password is forgotten, press and hold the Tag switch for more than ten seconds to restore the default password. The cover must be removed to access the Tag switch. See Figure 5.1 below for the switch location.

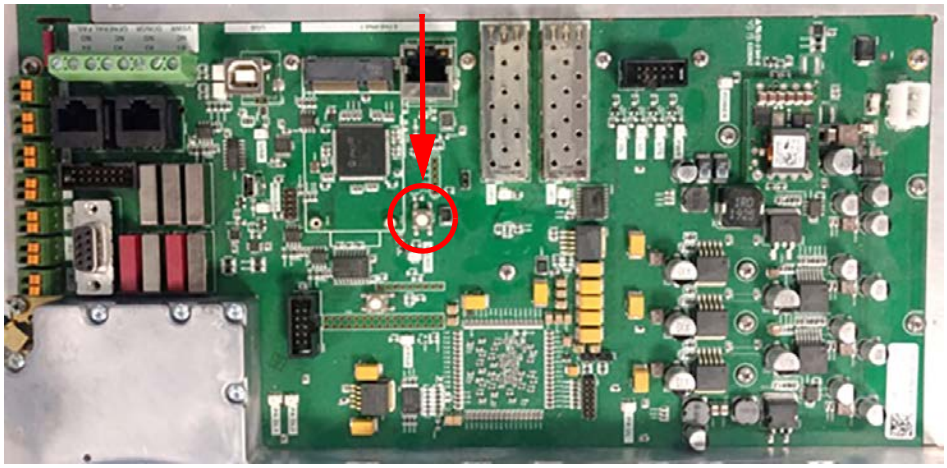


Figure 5.1 Tag Switch Location

5. Once the computer is connected to the signal booster, the GUI screen Interface appears.

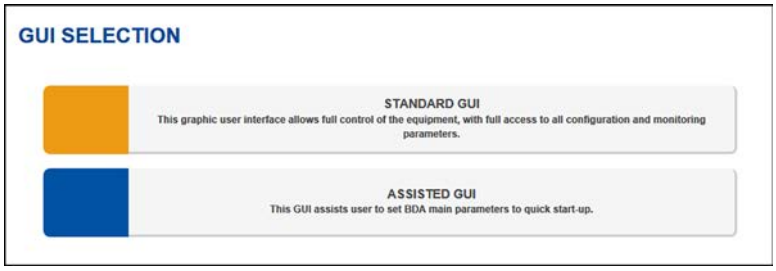


Figure 5.2 GUI Selection Options

5.3 Standard GUI and Assisted GUI Options

To program the system, select either of the following options:

- Standard GUI: Allows full control of the equipment including access to all configuration and monitoring parameters.
- Assisted GUI: Programming wizard that assists user to set the BDA main parameters for a quick start-up.

The Assisted GUI offers automatic calibration features to configure the device to reduce uplink noise from the BDA and create a “No Noise” system by setting the minimum uplink power needed, the minimum uplink gain needed, and the maximum uplink squelch threshold needed.

5.3.1 Standard GUI Option

After selecting Standard GUI, the following screen appears.

Figure 5.3 Standard GUI Setup Screen

1. Set desired channel frequencies if channel filtering is required.

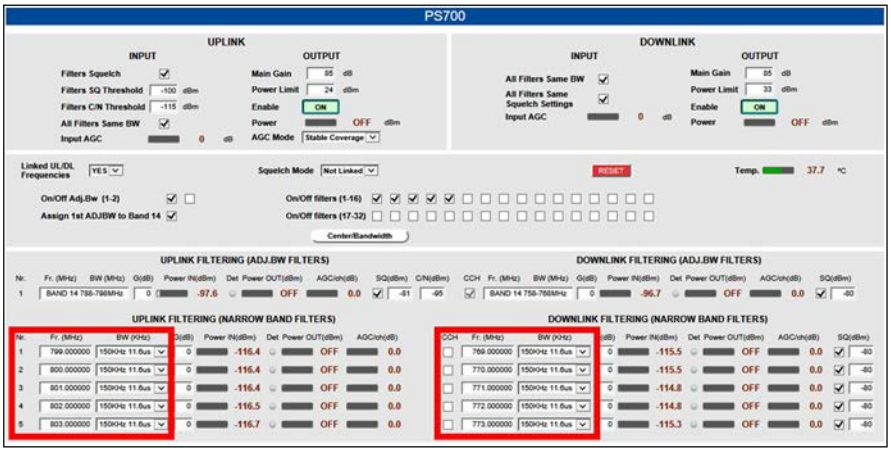


Figure 5.4 Channel Frequency Filtering Screen

2. Set the Start and Stop frequencies if adjustable bandwidth filtering is required.

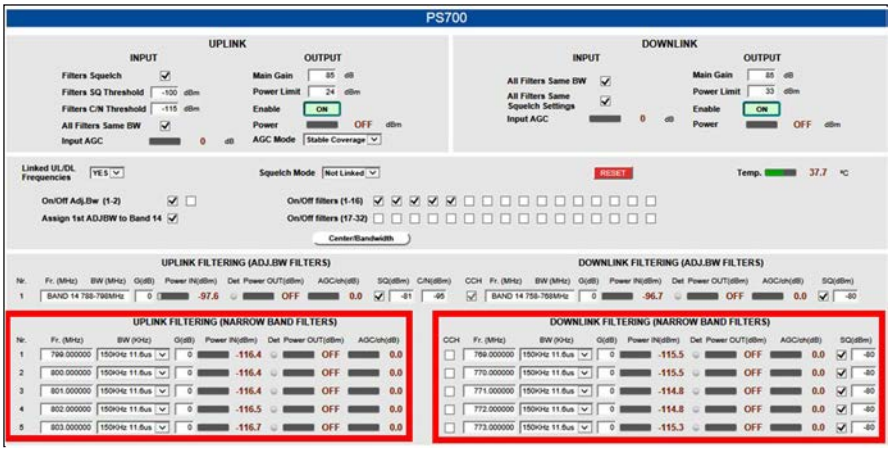


Figure 5.5 Adjustable Bandwidth Filtering Screen

3. For US applications where FirstNet amplification is required, select “Assign 1st ADJBW to Band 14".

NOTE: For Canadian applications, Band 14 is unavailable. Do not select this option.

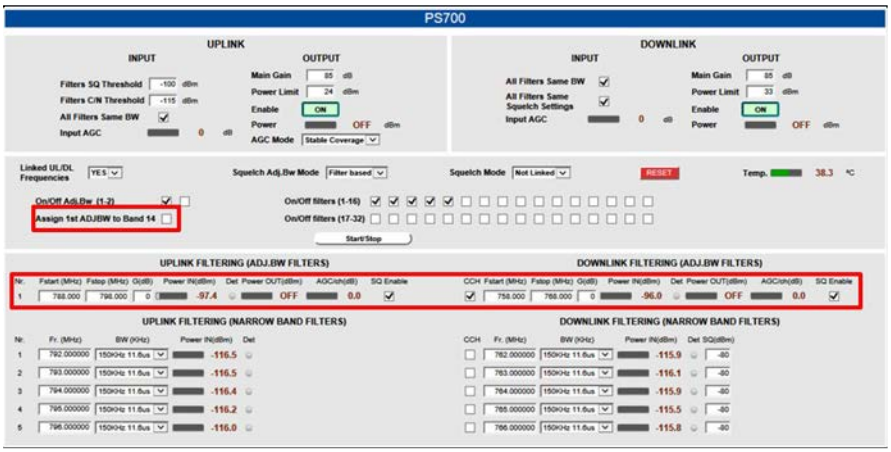


Figure 5.6 FirstNet Amplification (US Applications Only)

4. Enable the UL and DL power amplifiers. Click to turn the UL and DL settings ON. Verify there are no active alarms on the unit.

Choose between two AGC Modes:

- **Stable Coverage**: Maximum UL power per channel will be fixed equally by the number of configured filters. Channel output power will not vary based on the UL traffic, providing the most possible stable coverage.
- **Max Power**: Maximum UL power per channel will be dependent on the number of channels being transmitted. UL channel output power will be dynamic and will vary depending on the UL traffic. The power per channel will be higher when there is lower traffic.

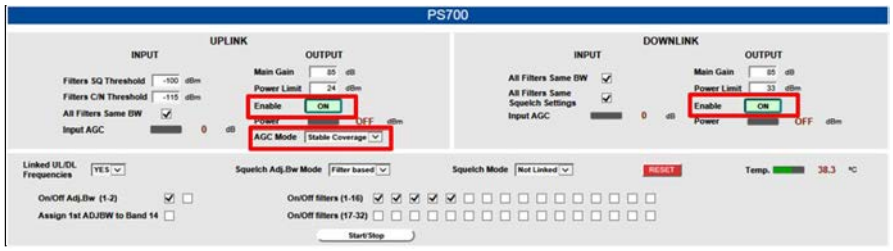


Figure 5.7 Power Amplifier Enable/Automatic Gain Control Screen

5. **Set Desired Operating Gain**: UL and DL streams are independent, so both values must be set. It is recommended to set DL AGC at 3-6 dB on each channel to achieve maximum power output.

6. **Set Squelch Settings**: Controls are independent in UL and DL bands. Configure a common UL Squelch Threshold for the UL channel filter, independent UL and DL Squelch Threshold per ADJBW filter, or independent per channel DL filter. Also, configure the C/N (carrier-to-noise) Threshold and Squelch.

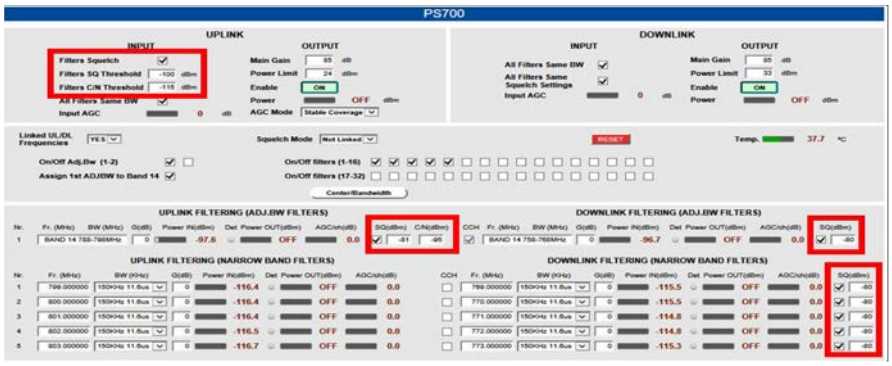


Figure 5.8 Squelch Settings Screen

7. Configure the desired filter bandwidth, depending on the presence of adjacent channels. The wider the filter, the lower the added delay. If an adjacent signal is detected, narrow filters can be used. The Spectrum Analyzer of FCS can be used to identify undesired signals. It is recommended that the output power of adjacent channels be at least 10 dB lower than the amplified signal.

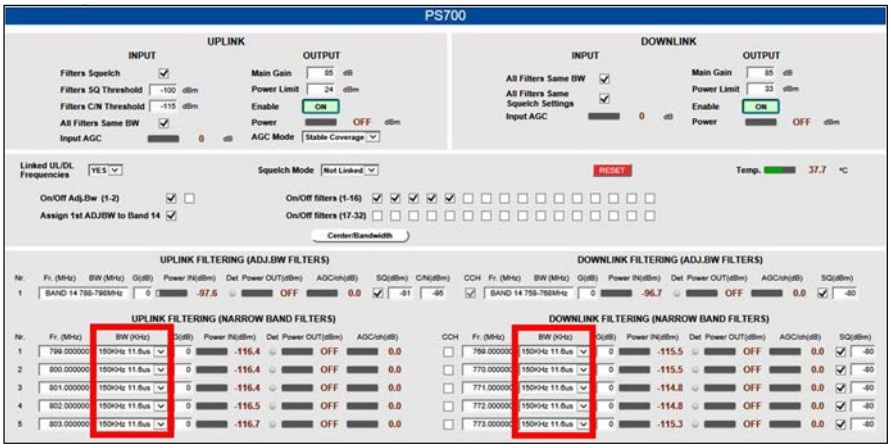


Figure 5.9 Filter Bandwidth Screen

8. Use the integrated Spectrum Analyzer to verify the spectrum.

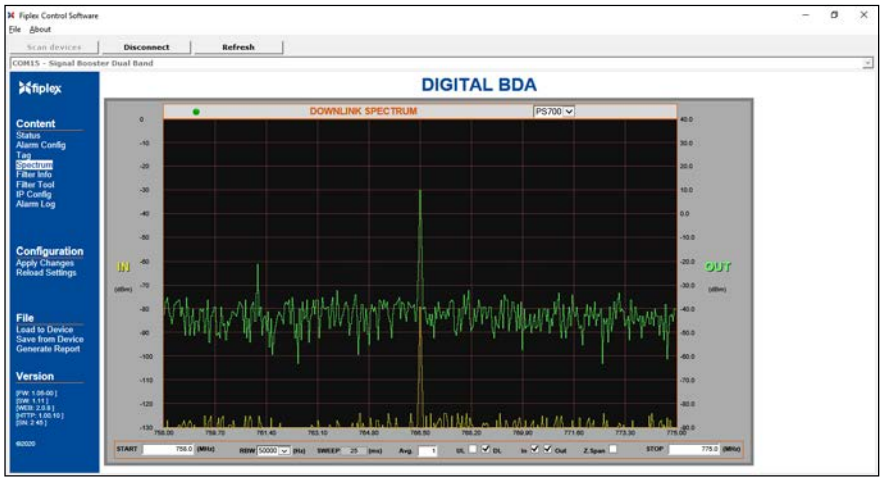


Figure 5.10 Spectrum Analyzer Screen

5.3.2 Assisted GUI

After selecting the Assisted GUI, the following screen appears. There are seven steps to complete the configuration using the Assisted GUI.

Figure 5.11 Assisted GUI Dashboard

Project Related

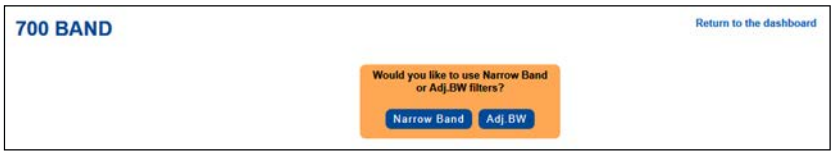
Enter all the required information.

Figure 5.12 Project Related Screen

700 MHz Band Programming

The unit operates in both 700 MHz and 800 MHz frequencies. Start programming the unit by configuring the 700 MHz selections. The following screen appears. Press yes to configure the 700 MHz Band.

Select Narrow Band or Adjustable Bandwidth (Adj.BW) filters.



Complete steps 1-7 to configure the 700 Band frequency.

1. Select the number of channels.

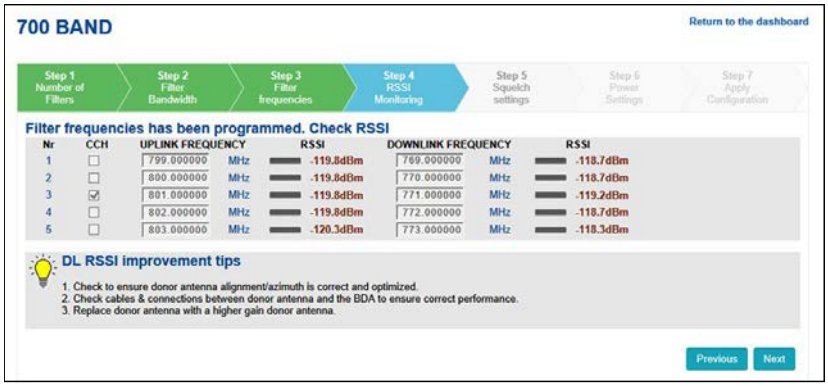
2. Select the filter bandwidth.

If a bandwidth greater than 75 KHz is selected, apply the following label to the unit.

Part 90 Signal Boosters. This is a 90.219 CLASS B DEVICE.
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 B signal boosters (as defined in 47 CFR 90.219) online at **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.

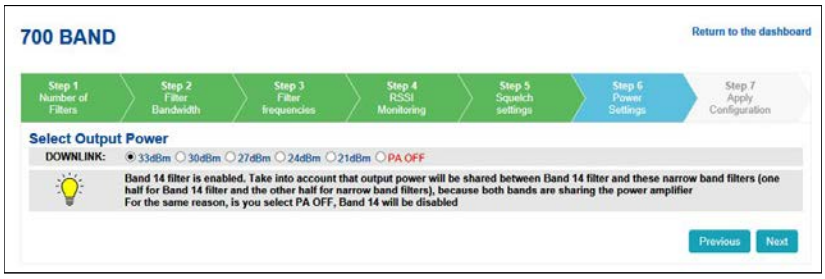
3. Select a frequency for each filter. Select frequencies based on the jurisdiction in which the equipment is installed.

4. Verify RSSI (Received Signal Strength Indicator) monitoring values.

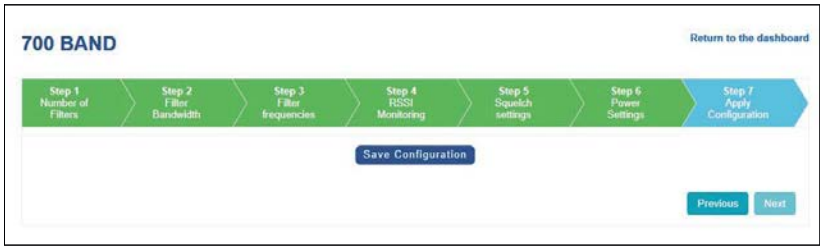


5. Select a squelch setting from the drop-down menu.

6. Select a power output.



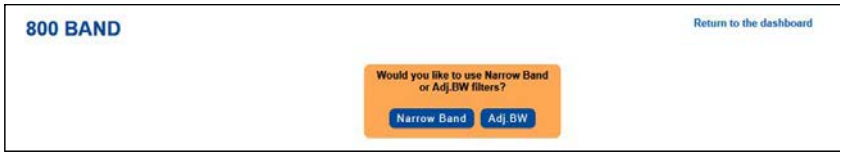
7. Save the configuration. The 800 Band configuration screen appears upon save.



800 MHz Band Programming

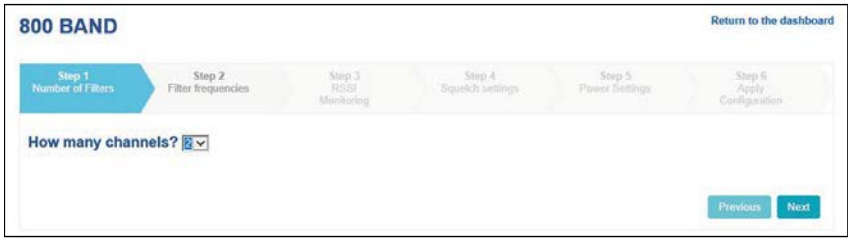
Click Yes to configure the 800 MHz Band.

Select Narrow Band or Adjustable Bandwidth (Adj.BW) Filters.



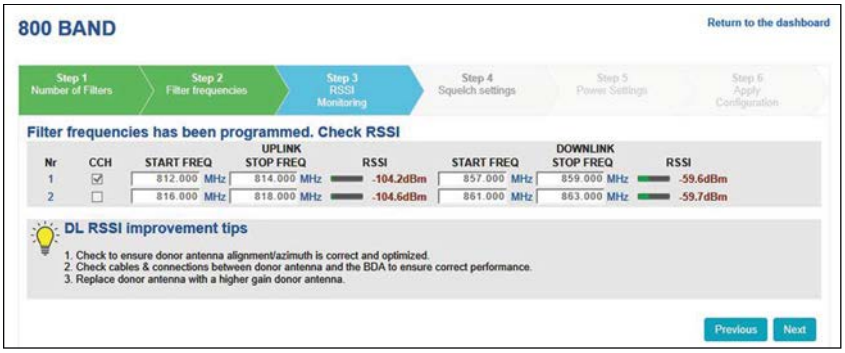
Complete steps 1-7 to configure the 800 Band frequency.

1. Select the number of channels.

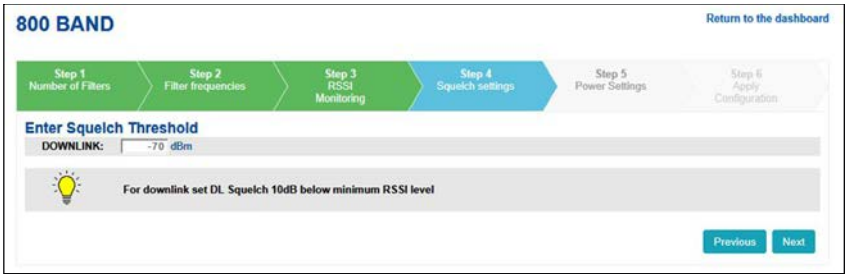


2. Select a frequency for each filter. Select frequencies based on the jurisdiction in which the equipment is installed.

3. Verify RSSI (Received Signal Strength Indicator) monitoring values.

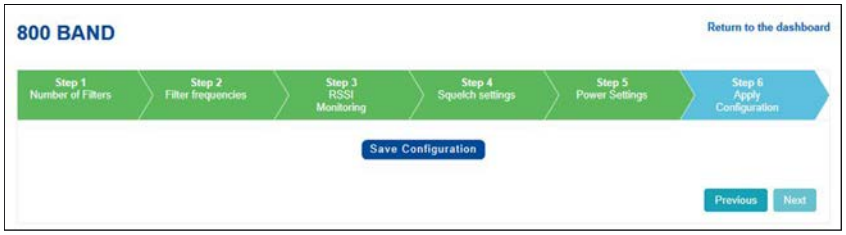


4. Select a Squelch setting from the drop-down menu.



5. Select a power output.

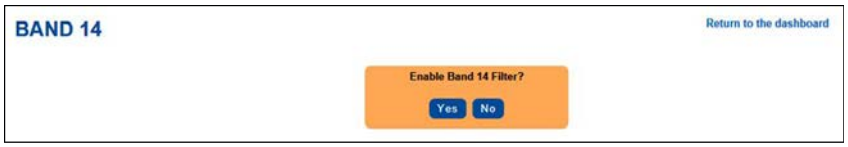
6. Save the 800 Band configuration. The Band 14 Screen appears (for US applications only).



Band 14 Programming (US Applications Only)

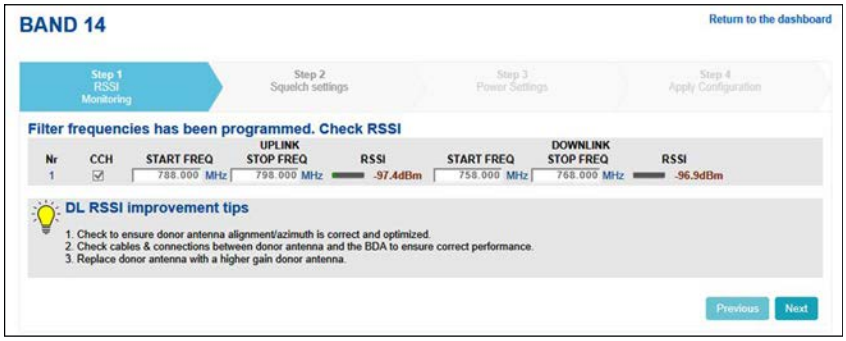
Click Yes to configure Band 14.

Click Yes to enable the Band 14 filter.



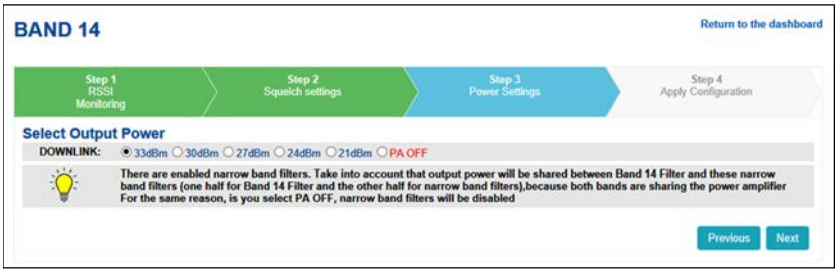
Complete steps 1-4 to configure Band 14.

1. Verify RSSI (Received Signal Strength Indicator) monitoring values.

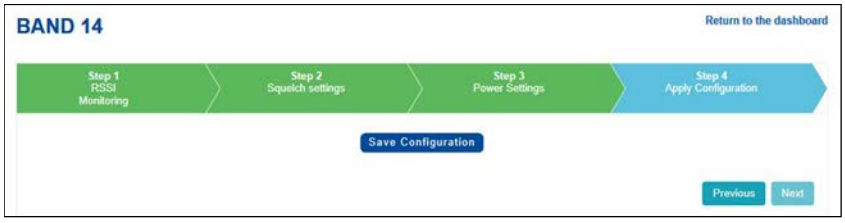


2. Select a Squelch setting from the drop-down menu.

3. Select a power output.

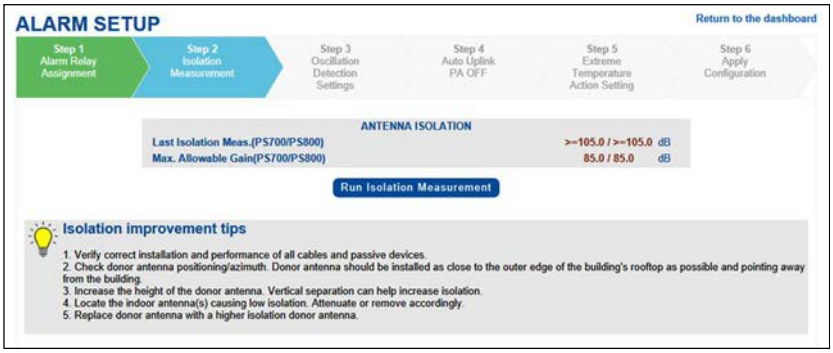


4. Save the Band 14 configuration.

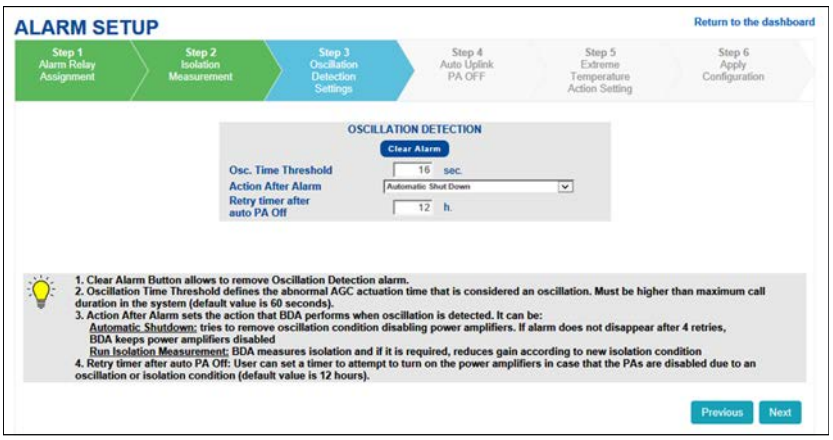


Alarm Setup

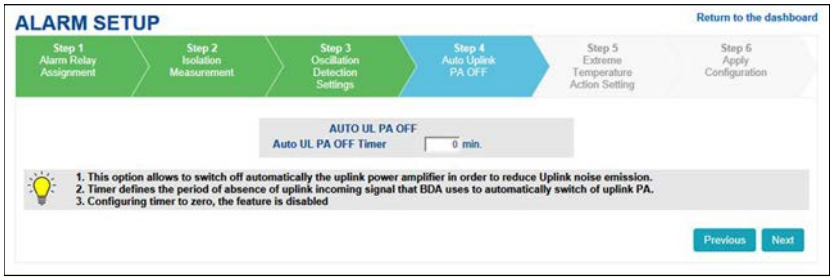
1. Configure the Alarm Setup. Set the following relay settings.
   - **Relay 1:** Rx Power Low
   - **Relay 2:** VSWR
   - **Relay 3:** Antenna disconnection
   - **Relay 4:** HW Fail, High Temperature, Oscillation detection, UL Pa Fail, Overload DL, DL PA Fail, Tx Power low, and DL AGC Fail
2. Run the Isolation Measurement and then click Next.



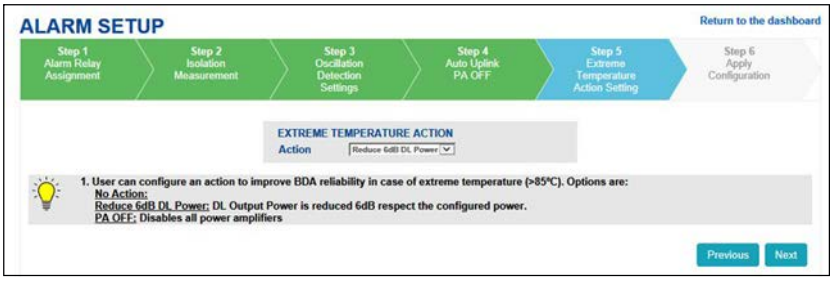
3. Configure the oscillation settings and click Next.



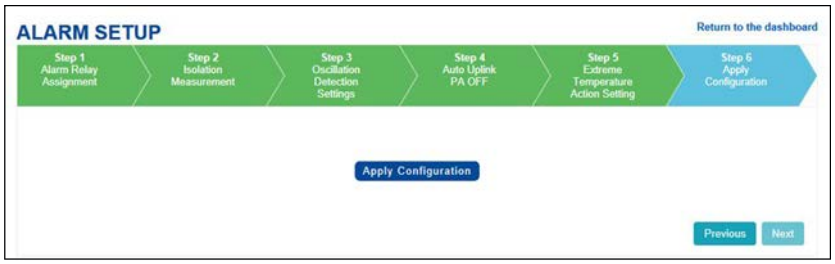
4. Set the automatic PA shutoff time and click Next.



5. Set the action to be taken if extreme temperatures are detected and click Next.



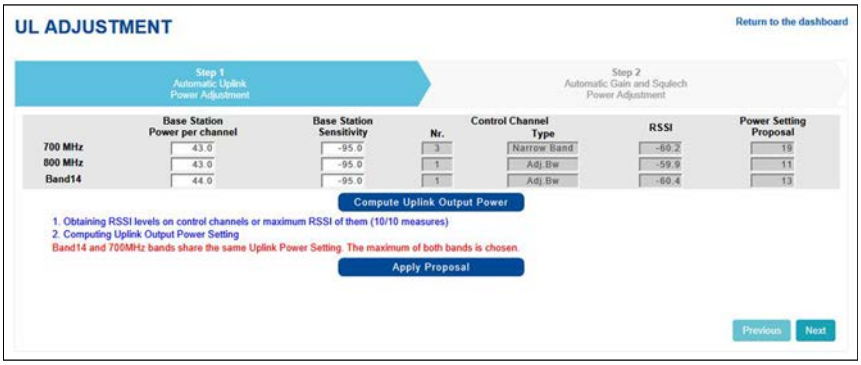
6. Click to save the configuration to the signal booster.



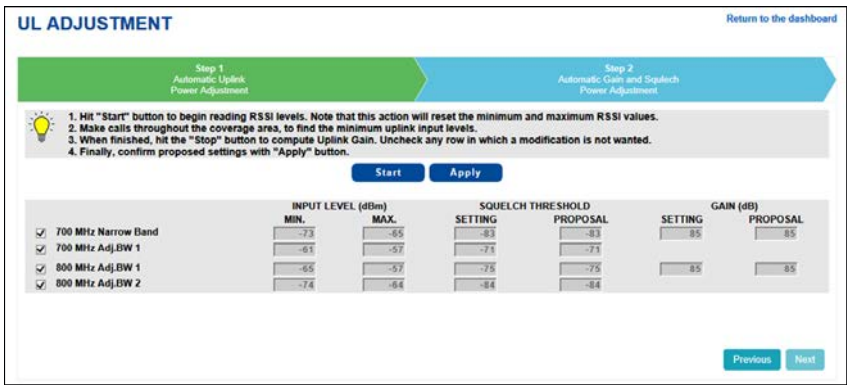
UL Adjustment

Adjust the Uplink values. The software will auto-adjust as necessary.

1. Automatic Uplink Power Adjustment
   Click Compute Uplink Output Power. Review the results and apply/adjust as necessary. Click Next when finished.



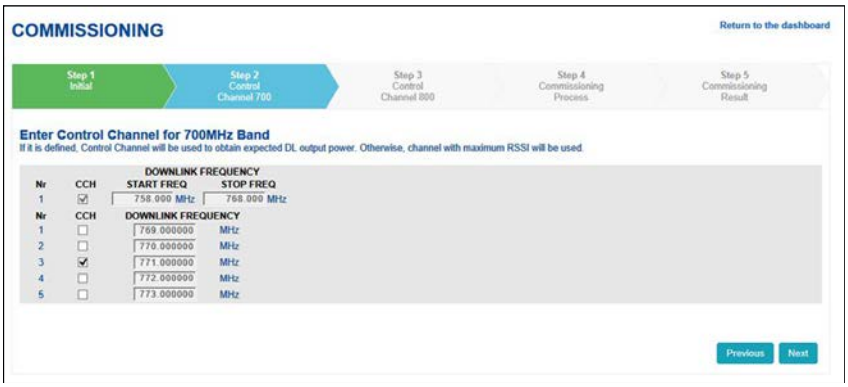
2. Press Start to evaluate RSSI levels, Squelch Thresholds, and Gain values. Accept the proposed changes or readjust manually.



Commissioning

This process is a final check to the configuration.

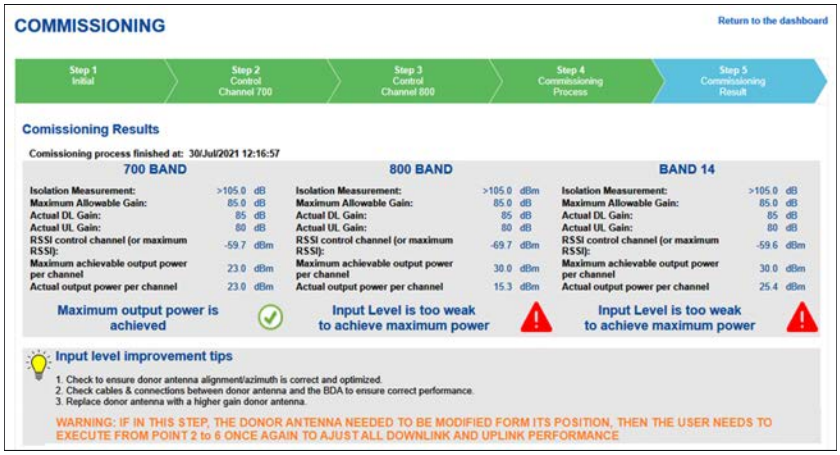
1. Verify that all the previous steps have been completed.
2. Confirm the channel frequencies for the 700 Band and then click Next.

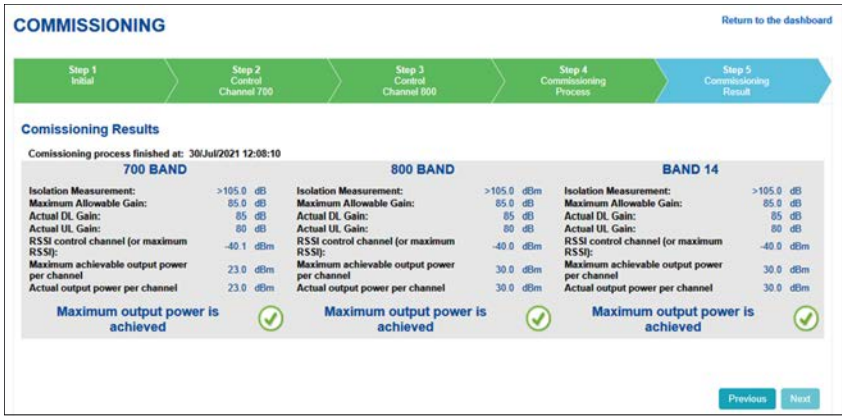


3. Confirm the channel frequencies for the 800 Band and then click Next.

4. Click “Run Process” to start measuring isolation and RSSI levels.

5. The results display. Correct any issues found.





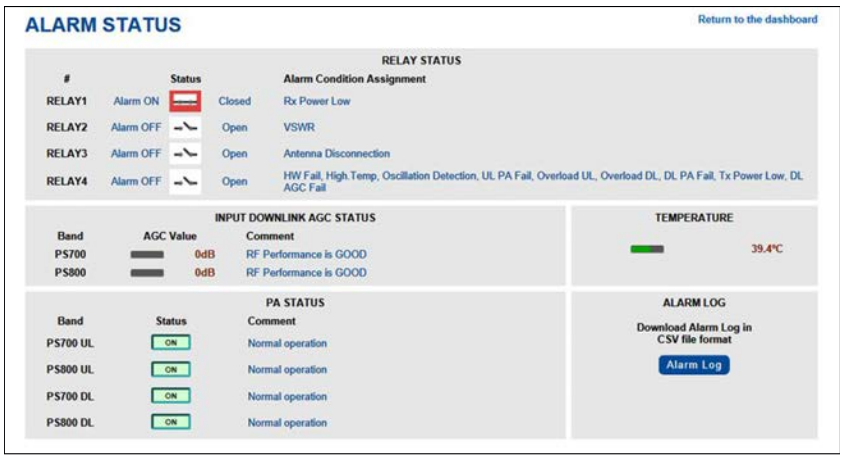
5.4 Utilities

FCS offers three utilities to help with programming.

- Alarm Status
- Spectrum Analyzer
- Reports

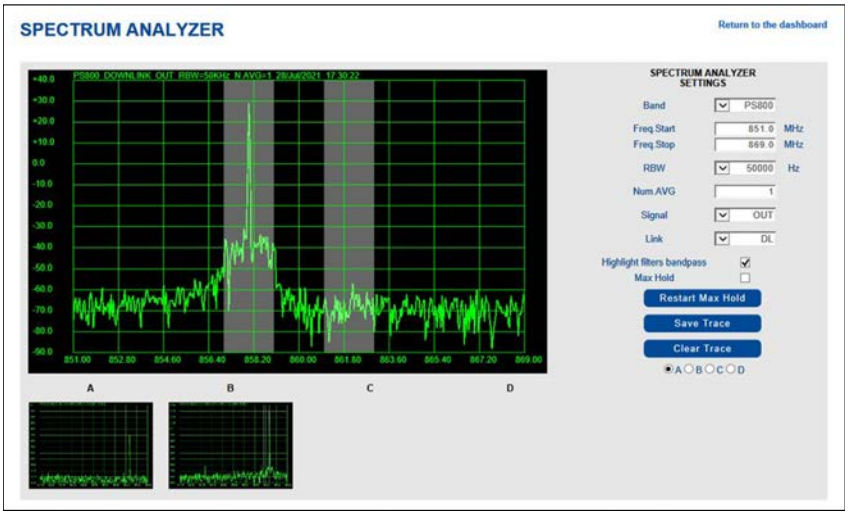
5.4.1 Alarm Status

On the FCS Dashboard, click Alarm Status. This will show the current status of the BDA unit. There is an option to print an Alarm history.



5.4.2 Spectrum Analyzer

Use the Spectrum Analyzer to help determine whether signals fall within required limits.



5.4.3 Reports

Click “Generate Report” to create a PDF that includes the device configuration information and functionality.

5.5 Laboratory Measurements

Contact Fiplex for specific verification and testing. Detailed procedures and recommended test setups are available.

Section 6: LED Annunciator

This device has an integrated LED annunciator located on the front door. This LED panel works as a status annunciator to visually indicate alarms.

Different alarm assignments can be arranged to generate a different annunciator configuration to be compliant with the local AHJ. Alternative overlays are included in the kit to accommodate the other options.

6.1 Option 1 - Default

By default, the device is configured and shipped using the following alarm format.

The internal default alarm assignment for this option is shown below.

CONFIGURATION ALARMS

GENERAL RELAY SETTINGS

	Name	Enabled	Polarity High	Relay 1	2	3	4	5	6	7	8		Name	Enabled	Polarity High	Relay 1	2	3	4	5	6	7	8
ALARM 1	HW Fail	☑		☐	☐	☑	☐	☐	☐	☐	☐	ALARM 2	High.Temp	☑		☐	☐	☑	☐	☐	☐	☐	☐
ALARM 3	Antenna Isolation	☑		☐	☐	☑	☐	☐	☐	☐	☐	ALARM 4	Oscillation Detection	☑		☐	☐	☑	☐	☐	☐	☐	☐
ALARM 5	UL PA Fail	☑		☐	☐	☑	☐	☐	☐	☐	☐	ALARM 6	Antenna Disconnection	☑		☐	☑	☐	☐	☐	☐	☐	☐
USER ALARM 1	External Input 1	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	USER ALARM 2	External Input 2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
USER ALARM 3	External Input 3	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	EXTERNAL INPUT	Force RF OFF	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

BAND-SPECIFIC RELAY SETTINGS

	Name	Enabled	Relay 1	2	3	4	5	6	7	8		Name	Enabled	Relay 1	2	3	4	5	6	7	8
ALARM 1	Overload UL	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 2	Overload DL	☑	☐	☐	☑	☐	☐	☐	☐	☐
ALARM 3	DL PA Fail	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 4	Tx Power Low	☑	☐	☐	☑	☐	☐	☐	☐	☐
ALARM 5	VSWR	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 6	Rx Power Low / Donor Antenna	☑	☐	☐	☐	☑	☐	☐	☐	☐
ALARM 7	DL AGC Fail	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 8	C/N UL Low	☑	☐	☐	☑	☐	☐	☐	☐	☐

BBU RELAY SETTINGS

	Name	Enabled	Relay 1	2	3	4	5	6	7	8		Name	Enabled	Relay 1	2	3	4	5	6	7	8
ALARM 1	Normal AC Power	☑	☑	☐	☐	☐	☐	☐	☐	☐	ALARM 2	Loss Normal AC Power	☑	☐	☐	☐	☐	☑	☐	☐	☐
ALARM 3	Battery Capacity Under 30%	☑	☐	☐	☐	☐	☐	☐	☑	☐	ALARM 4	Battery Charger Fail	☑	☐	☐	☐	☐	☐	☑	☐	☐
ALARM 5	BBU Communication Error	☑	☐	☐	☐	☐	☐	☐	☐	☑	ALARM 6	Charger Temperature	☑	☐	☐	☐	☐	☐	☐	☐	☑
ALARM 7	Battery Temperature	☑	☐	☐	☐	☐	☐	☐	☐	☑	ALARM 8	Individual Battery Voltage	☑	☐	☐	☐	☐	☐	☐	☐	☑
ALARM 9	Battery Disconnection	☑	☐	☐	☐	☐	☐	☐	☑	☐	ALARM 10	System Voltage	☑	☐	☐	☐	☐	☐	☐	☐	☑
ALARM 11	Battery Bank Voltage	☑	☐	☐	☐	☐	☐	☐	☐	☑	ALARM 12	Annunciators		☐	☐	☐	☐	☐	☐	☐	☑
ANNUNCIATOR 1	Annunciator 1	☐									ANNUNCIATOR 2	Annunciator 2	☐								
ANNUNCIATOR 3	Annunciator 3	☐									ANNUNCIATOR 4	Annunciator 4	☐								

LED color assignments are as follows.

Indicator Name	Normal Condition LED Color	Alarm Condition LED Color
AC Power	Green	OFF
AC Fail - Battery Active	OFF	Red
Battery Capacity < 30%	OFF	Red
Battery Charger Fail	OFF	Red
Donor Antenna Diconnect	OFF	Red
Donor Antenna Malfunction	OFF	Red
RF Emitter Fail	OFF	Red
System Component Failure	OFF	Red

Table 6.1 Default Annunciator LED Assignment

6.2 Option 2

The following is a second option for the LED configuration.

1. Stick the Option #2 overlay on top of the existing one.

2. Connect a laptop to the device USB port.
3. Run FCS.
4. From “Content” panel located at left side, select the “Alarm Config” menu.
5. Change the following settings only. Leave the other settings as is.
   – For *Oscillation Detection* alarm, change from Relay 3 to Relay 4.
   – For *RX Power Low / Donor Antenna* alarm, change from Relay 4 to Relay 2.
6. From *Content* panel located at left side, click on the *Apply Changes* menu.

CONFIGURATION ALARMS

GENERAL RELAY SETTINGS

	Name	Enabled	Polarity High	Relay 1	2	3	4	5	6	7	8		Name	Enabled	Polarity High	Relay 1	2	3	4	5	6	7	8
ALARM 1	HW Fail	☑		☐	☐	☑	☐	☐	☐	☐	☐	ALARM 2	High.Temp	☑		☐	☐	☑	☐	☐	☐	☐	☐
ALARM 3	Antenna Isolation	☑		☐	☐	☑	☐	☐	☐	☐	☐	ALARM 4	Oscillation Detection	☑		☐	☐	☐	☑	☐	☐	☐	☐
ALARM 5	UL PA Fail	☑		☐	☐	☑	☐	☐	☐	☐	☐	ALARM 6	Antenna Disconnection	☑		☐	☑	☐	☐	☐	☐	☐	☐
USER ALARM 1	External Input 1	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	USER ALARM 2	External Input 2	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
USER ALARM 3	External Input 3	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	EXTERNAL INPUT	Force RF OFF	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐

BAND-SPECIFIC RELAY SETTINGS

	Name	Enabled	Relay 1	2	3	4	5	6	7	8		Name	Enabled	Relay 1	2	3	4	5	6	7	8
ALARM 1	Overload UL	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 2	Overload DL	☑	☐	☐	☑	☐	☐	☐	☐	☐
ALARM 3	DL PA Fail	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 4	Tx Power Low	☑	☐	☐	☑	☐	☐	☐	☐	☐
ALARM 5	VSWR	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 6	Rx Power Low / Donor Antenna	☑	☐	☑	☐	☐	☐	☐	☐	☐
ALARM 7	DL AGC Fail	☑	☐	☐	☑	☐	☐	☐	☐	☐	ALARM 8	C/N UL Low	☑	☐	☐	☑	☐	☐	☐	☐	☐

BBU RELAY SETTINGS

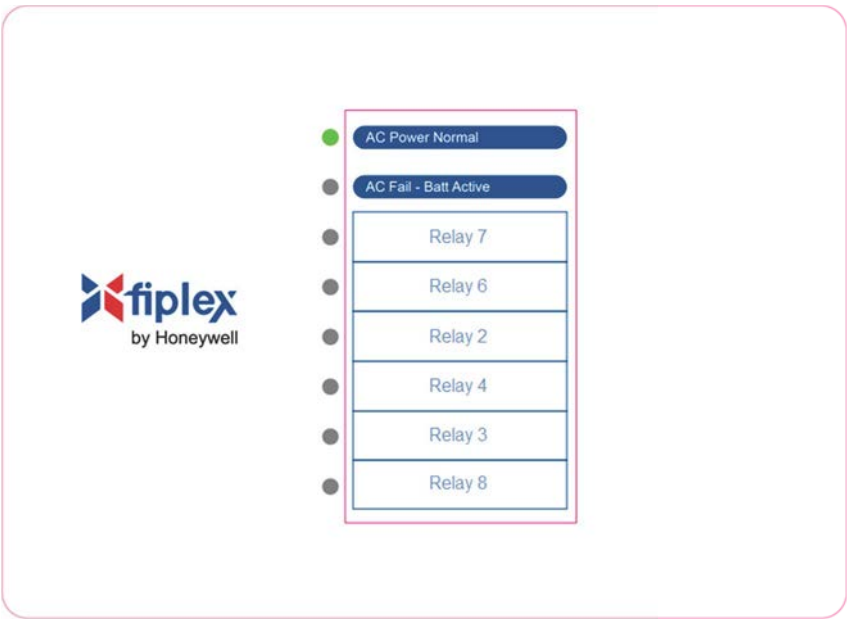
	Name	Enabled	Relay 1	2	3	4	5	6	7	8		Name	Enabled	Relay 1	2	3	4	5	6	7	8
ALARM 1	Normal AC Power	☑	☑	☐	☐	☐	☐	☐	☐	☐	ALARM 2	Loss Normal AC Power	☑	☐	☐	☐	☐	☑	☐	☐	☐
ALARM 3	Battery Capacity Under 30%	☑	☐	☐	☐	☐	☐	☐	☑	☐	ALARM 4	Battery Charger Fail	☑	☐	☐	☐	☐	☐	☑	☐	☐
ALARM 5	BBU Communication Error	☑	☐	☐	☐	☐	☐	☐	☐	☑	ALARM 6	Charger Temperature	☑	☐	☐	☐	☐	☐	☐	☐	☑
ALARM 7	Battery Temperature	☑	☐	☐	☐	☐	☐	☐	☐	☑	ALARM 8	Individual Battery Voltage	☑	☐	☐	☐	☐	☐	☐	☐	☑
ALARM 9	Battery Disconnection	☑	☐	☐	☐	☐	☐	☐	☑	☐	ALARM 10	System Voltage	☑	☐	☐	☐	☐	☐	☐	☐	☑
ALARM 11	Battery Bank Voltage	☑	☐	☐	☐	☐	☐	☐	☐	☑	ALARM 12	Annunciators		☐	☐	☐	☐	☐	☐	☐	☑
ANNUNCIATOR 1	Annunciator 1	☐									ANNUNCIATOR 2	Annunciator 2	☐								
ANNUNCIATOR 3	Annunciator 3	☐									ANNUNCIATOR 4	Annunciator 4	☐								

6.3 Option 3

Option 3 is the most flexible option for annunciator panel. All alarms except AC Normal Power and AC fail can be user defined.

1. Stick the Option #3 overlay on top of the existing one.

2. Connect a laptop to the device USB port.
3. Run FCS.
4. From “Content” panel located at left side, select the “Alarm Config” menu.
5. Leave the following settings as is. Any others can be configured as desired. Use the following overlay as a reference to relay assignment.
   – The *Normal AC Power* alarm must always be assigned to **Relay 1**.
   – The *Normal AC Power Loss* alarm must always be assigned to **Relay 5**.



6. From *Content* panel located at left side, click on the *Apply Changes* menu.
7. Use a marker to fill in the programmed alarm assignments on the overlay.

Section 7: License Upgrades

Some Fiplex models can be upgraded with new features with the use of a software license. These models are listed in the table below.

Model Number	Description
HONBDA-7S27B-IB-10	PS 700 and 800MHz Dual Band including Band 14, Class B, 0.5W / +27dBm per band, DC. NFPA compliant, UL2524 2nd Edition Listed Fiplex by Honeywell Digital BDA with batteries and Narrow band
HONBDA-7S27B-IB-18	PS 700 and 800MHz Dual Band including Band 14, Class B, 0.5W / +27dBm per band, DC. NFPA compliant, UL2524 2nd Edition Listed Fiplex by Honeywell Digital BDA with batteries and Wide band
HONBDA-7S27B-IB-06	PS 700 and 800MHz Dual Band including Band 14, Class B, 0.5W / +27dBm per band, DC. NFPA compliant, UL2524 2nd Edition Listed Fiplex by Honeywell Digital BDA with batteries and Wide band

Table 7.1 Upgradeable Models

The following licenses are available for use with these models.

License	Description
BDA-LIC-D33B-D33A	Configuration Upgrade, Digital 700/800 BDA Family. From PS700&PS800, +33dBm, Class B to PS700&PS800, +33dBm, Class A
BDA-LIC-D27A-D33A	Configuration Upgrade, Digital 700/800 BDA Family. From PS700&PS800, +27dBm, Class A to PS700&PS800, +33dBm, Class A
BDA-LIC-D27B-D33B	Configuration Upgrade Digital 700/800 BDA Family. From PS700&PS800, +27dBm, Class B to PS700&PS800, +33dBm, Class B
BDA-LIC-D27B-D27A	Configuration Upgrade Digital 700/800 BDA Family. From PS700&PS800, +27dBm, Class B to PS700&PS800, +27dBm, Class A
BDA-LIC-D27B-D33A	Configuration Upgrade Digital 700/800 BDA Family. From PS700&PS800, +27dBm, Class B to PS700&PS800, +33dBm, Class A

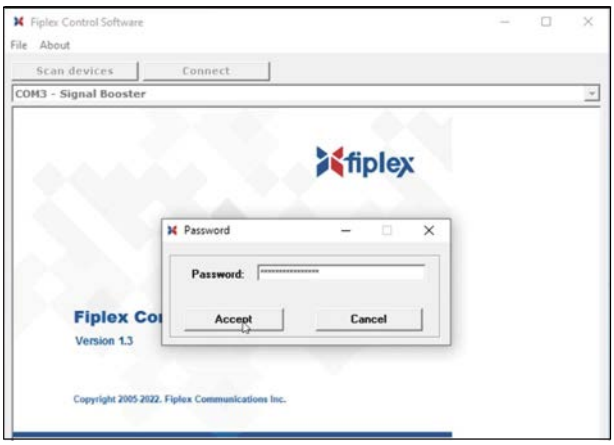
Table 7.2 Available Licenses

7.1 Installation

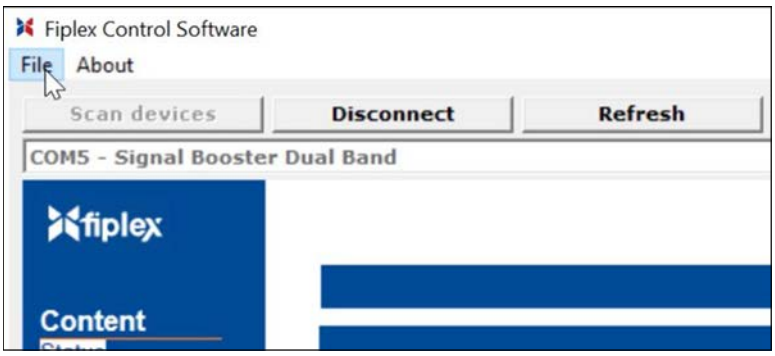
Use FCS to upgrade the license.

1. Click “Connect”.

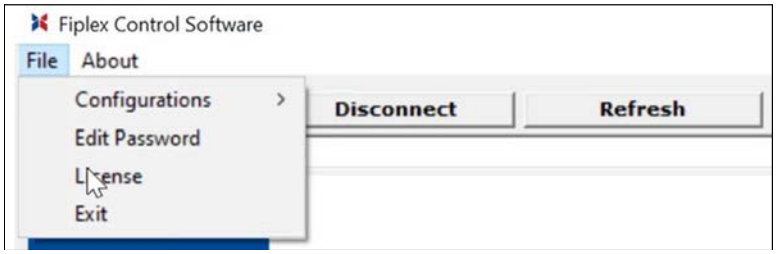
2. Enter the password as described in Section 5.2 and click “Accept”.



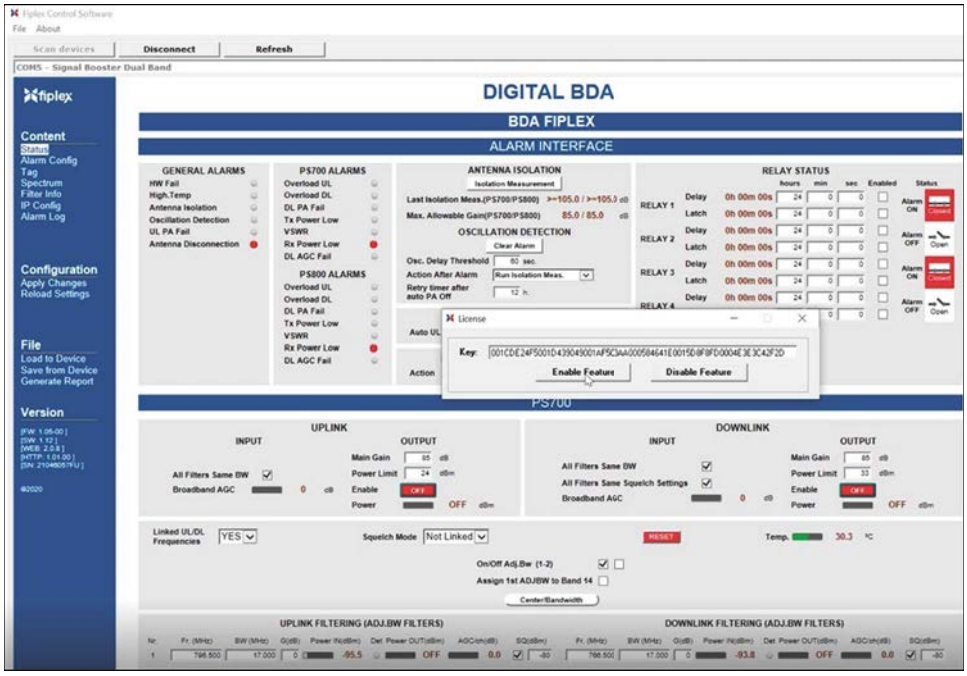
3. Click “File” in the upper left corner.



4. Choose “License” from the File menu.



5. Use the license provided by Fiplex and click “Enable Features”.



After a few seconds, the software will update and the upgraded features can be used.

Section 8: Operation

8.1 Audible Alarm Silence

Each device is equipped with an audible alarm. The alarm will sound in case any alarm event is triggered. To mute the buzzer, open the enclosure door and press the button indicated below.

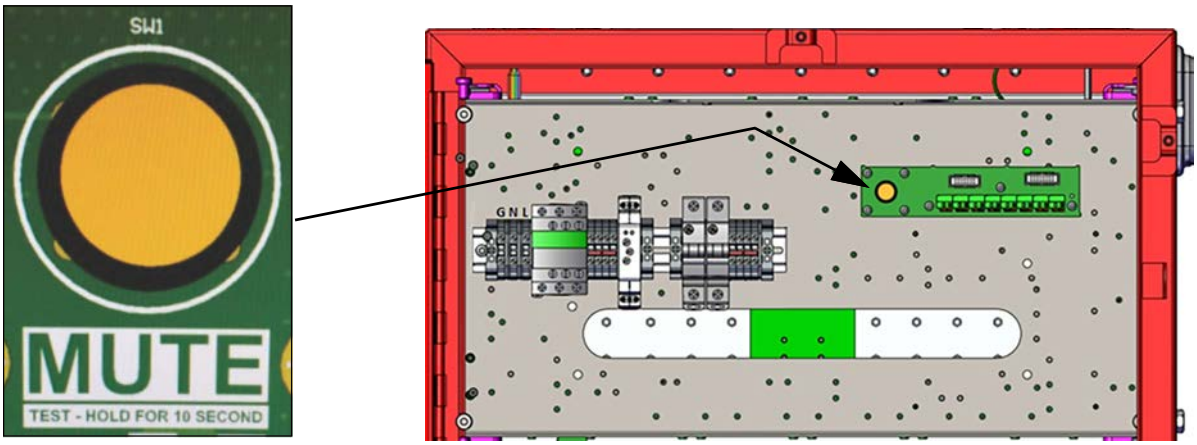


Figure 8.1 Mute Button Location

8.2 Lamp and Dry Contact Test

To test the condition of the LEDs and the dry contact outputs, press and hold the Mute button for 10 seconds. The test will last for the amount of time that the button is held. To end the test, release the button.

8.3 Emergency Power Off (EPO) Button Connections

WARNING: DISCONNECT POWER

ENSURE POWER IS OFF BEFORE MAKING ANY WIRING CONNECTIONS.

To install the EPO switch/button, follow these steps.

1. Disconnect the cable between the A1 terminal and the 3rd terminal block.

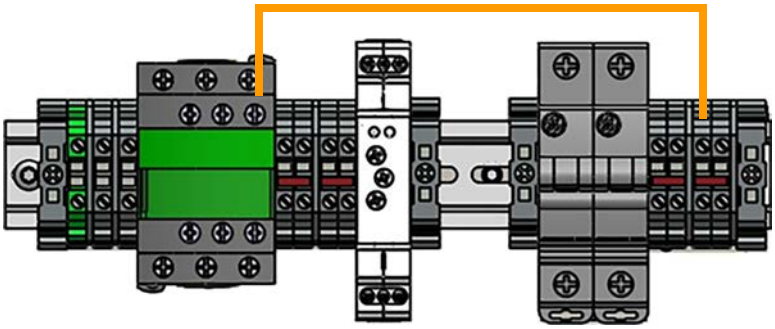


Figure 8.2 Disconnect Cable

2. Replace the cable with a normally closed contact switch. If the circuit opens, the device will shut down.

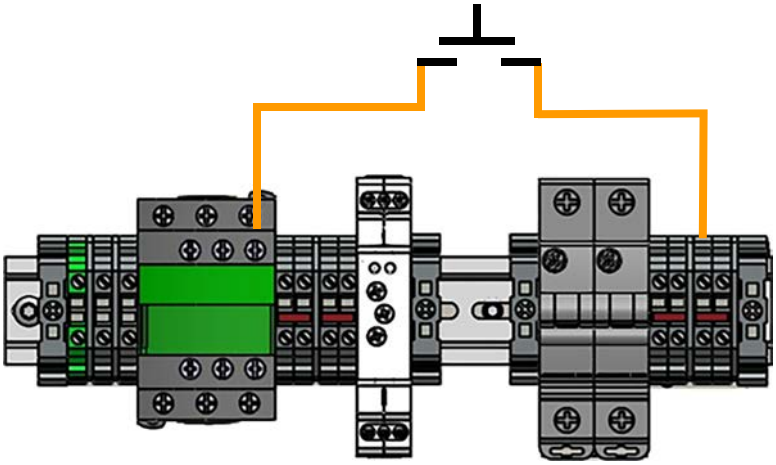


Figure 8.3 Normally Closed Contact

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fiplex
by Honeywell