FEDERAL SIGNAL
Safety and Security Systems

UltraVoice® Integrated Controller

Model: UVIC-B

Description, Specifications, Installation, Operation, and Service Manual

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Safety Messages

⚠ WARNING

It is important to follow all instructions shipped with this product. This device is to be installed by trained personnel who are thoroughly familiar with the country electric codes and will follow these guidelines as well as local codes and ordinances, including any state or local noise control ordinances. Listed below are important safety instructions and precautions you should follow:

Important Notice

Federal Signal reserves the right to make changes to devices and specifications detailed in the manual at any time in order to improve reliability, function or design. The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for any inaccuracies.

Publications

Federal Signal recommends the following publications from the Federal Emergency Management Agency for assistance with planning an outdoor warning system:

- The “Outdoor Warning Guide” (CPG 1-17)
- “Civil Preparedness, Principles of Warning” (CPG 1-14)
- FEMA-REP-1, Appendix 3 (Nuclear Plant Guideline)
- FEMA-REP-10 (Nuclear Plant Guideline).

Planning

- If suitable warning equipment is not selected, the installation site for the siren is not selected properly or the siren is not installed properly, it may not produce the intended optimum audible warning. Follow Federal Emergency Management Agency (FEMA) recommendations.
- If sirens are not activated in a timely manner when an emergency condition exists, they cannot provide the intended audible warning. It is imperative that knowledgeable people, who are provided with the necessary information, be available at all times to authorize the activation of the sirens.
- When sirens are used out of doors, people indoors may not be able to hear the warning signals. Separate warning devices or procedures may be needed to effectively warn people indoors.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings, and restrict access to areas near sirens. Review and comply with any local or state noise control ordinances as well as OSHA noise exposure regulations and guidelines.
- Activating the sirens may not result in people taking the desired actions if those to be warned are not properly trained about the meaning of siren sounds. Siren users should follow FEMA recommendations and instruct those to be warned of correct actions to be taken.
- After installation, service, or maintenance, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.

- If future service and operating personnel do not have these instructions to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also give a copy to anyone who is going to service or repair the siren.

Installation and Service

- Electrocution or severe personal injury can occur when performing various installation and service functions, such as making electrical connections, drilling holes, or lifting equipment. Therefore, only experienced electricians should install this product in accordance with national, state and any other electrical codes having jurisdiction. Perform all work under the direction of the installation or service crew safety foreman.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings and restrict access to areas near the sirens. Sirens may be operated from remote control points. Whenever possible, disconnect all siren power, including batteries, before working near the siren.
- After installation or service, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service personnel do not have these warnings and all other instructions shipped with the equipment to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also give a copy to anyone who is going to service or repair the sirens.

Operation

Failure to understand the capabilities and limitations of your siren system could result in permanent hearing loss, other serious injuries or death to persons too close to the sirens when you activate them or to those you need to warn. Carefully read and thoroughly understand all safety notices in this manual and all operations-related-items in all instruction manuals shipped with equipment. Thoroughly discuss all contingency plans with those responsible for warning people in your community, company, or jurisdiction.

Read and understand the information contained in this manual before attempting to install or service the siren.

Pay careful attention to notices located on the equipment.

General Description

Introduction

This manual describes the features, specifications, installation, operation, and maintenance of the UltraVoice® Integrated Controller (UVIC-B). The UVIC-B is designed to deliver amplified audio to a network of speakers (sold separately) for indoor or outdoor notification, evacuation, and public address. The UVIC-B is an upgrade for SelecTone® or other basic plant or campus notification systems. The UVIC-B provides live public address, tone, or voice alerts through microSD interface and battery backup operation.

The UVIC-B is housed in a single NEMA1 style cabinet for indoor mounting. The UVIC-B uses one amplifier card for a 400-watt system and two amplifiers cards for an 800-watt system. All siren control, audio generation, and remote communication functions are handled by a single UV+ Controller. The system operates from a 24 Vdc battery source, which provides battery backup. The charging system can operate from 120 or 240 volt power.

All UVIC-B models are set up for two-way control and status monitoring using the Commander® Software System (Commander) including a nominal 12 V radio power supply. You can equip all models with a microSD card to store up to 17 hours of tone or digital voice messages. Custom digital voice recording are available.

Activation codes, command sequences, and operating parameters are uploaded from a computer through the RS232 port located on the UV+ Controller or over the radio channel with Commander. All user information is stored in non-volatile memory, immune to power and battery failure.

You can activate the UVIC-B locally using a Local Operation Console (UVLOC-B) or remotely using radio or IP networking. You can use the UVIC-B as a part of an outdoor alerting system or as a stand-alone notification panel.

Features

The UVIC-B controller has the following features.

- Indoor enclosure with up to 800 watts for indoor or outdoor notifications.
- Battery backup for operation during power loss.
- Integral operating console interface for up to four remote consoles.
- Remote consoles (UVLOC-B) provide up to 10 functions and local public address (Live PA).
- Remote consoles (UVLOC-B) can be located up to 1 mile (1609 meters) from the cabinet with supervision.
- 70 V speaker operation standard with optional Audio Distribution Module (UVADM) for 25 V speaker operation.
- Seven standard warning signals: wail, alternate wail, pulsed wail, steady, alternate steady, pulsed steady, and Westminster chime (auxiliary).
- Configurable for up to eight supervised zones.

- Optional microSD card for custom message storage. Store up to 4,093 voice or tone messages that total up to 17 hours of total recording time.
- Local switches (eight) on the UV+ Controller for testing or local siren activation.
- Ability to test or activate a siren using external contact closure.
- Optional local microphone for live public address (PA) with internal mount.
- Single tone, Two-tone, DTMF, EAS and MSK decoders for remote siren control.
- Four relays for local activation of strobes, LEDs, and legacy rotation siren designs.
- Siren activation verification through specialized Quiet Test.
- Ability to select or group amplifiers to create flexible zones.
- Volume control per message to optimize siren notification.
- Modular hot swappable design to easily service cards without shutting off the power.
- Ability to stack multiple voice and tone alerts to create custom messages.
- Status system monitoring for system health and readiness.
- Flexible communications—radio (analog, P25, trunking, digital, broadband), satellites, cellular, landline, and IP).
- Cellular and satellite communication options are available upon request. Contact your local Federal Signal sales representative for more information.
- Ability to mix various communication formats for high-system availability and redundancy.
- Secure communication with 128-bit or 256-bit encryption.
- Secure activation programming and status monitoring through the SS2000+ AC and Commander Software System.
- Audio output (600 ohms) to external equipment, such as fire alarm panels or amplifiers.
- Power control ramps up siren or speaker volume for added safety, custom volume settings, and low power testing.

Cabinet Features

- Single NEMA1/UL type 1, powder coated steel cabinet.
- Single lockable door latch that can be easily opened without tools.
- Wall mountable.
- Multi-size knockouts for conduit entrances.
- Bulkhead mounted type N female antenna connection.

Amplifiers Features

- Two amplifier slots for 400-watt amplifiers (Model UV400), with audio output of 70 V_{RMS}

Optional UltraVoice Audio Distribution Module (Model UVADM) Features

- Eight zone outputs.
- Each output is switch selectable for 25 or 70 V_{RMS}
- Each output is switch selectable for connection to Amplifier 1 or Amplifier 2.
- All outputs independently monitored for line or ground faults.

Optional UltraVoice Local Operating Console Interface Expansion Module (Model UVLOC-B-EXP) Features

- Expansion port that allows you to expand an additional eight UVLOC-B interfaces.

Batteries

- Sealed VRLA AGM type (included, minimum 44 A/H).

Battery Charger

- 120/240 Vac switch selectable to 24 Vdc, 5 A.
- Temperature compensated with selectable float voltage 13.2-13.8 Vdc.

Digital Voice Messages

When purchased, the Digital Voice option adds a microSD card that is capable of storing up to 17 hours or 4,093 pre-recorded messages. See “Digital Voice Recording” on page 56 for more information.

UVLOC-B Option

The UltraVoice Local Operating Console (UVLOC-B) is an activation point for an UVIC-B controller.

The UVLOC-B offers the following:

- Operator interface panel for controlling 10 functions/activations and live PA announcements.
- Remotely powered from the UVIC-B controller.
- NEMA1 indoor lockable enclosure.
- Activates pre-recorded digital voice messages and alerts.
- Noise canceling microphone for live PA announcements with volume control included.
- Three LEDs for status indicators for power, system armed, and fault.
- Locate the UVLOC-B up to 1 mile (1609 meters) from UVIC-B.
- Uses a single twisted-pair cable between the UVIC-B and the UVLOC-B.
- Monitored for line and ground faults with audible alerts.

The UVLOC-B is ideal for providing multiple activation points in an indoor Mass Notification System. The UVLOC-B is rated for indoor use and can be surface mounted. The UVIC-B backplane includes four jacks to connect to individual UVLOC-B units. The UVIC-B backplane includes an interface to a optional UVLOC-B-EXP board that allows you to expand from four interfaces to twelve UVLOC-B interfaces. Each UVLOC-B is hardwired using a single twisted-pair cable and is powered from its respective UVIC-B controller.

You may locate the UVLOC-B up to one mile from the UVIC-B controller and it requires no local power source of its own.

UVIC-B with IP

You can order the UVIC-B with a network card or as an add-on. The IP card allows communication over an IP network and provides audio decoding of digitized audio sent over the network.

The IP network card is configured with its own fixed IP address and port number. When packets of data are received over the network port that are addressed to the board's IP and port number, they are converted to serial data and sent out over the serial port. Likewise, any data coming into the serial port is converted to TCP/IP data packets and sent out over the network port to the server's IP address. The IP network card can also be configured to support DHCP.

UVIC-B Outputs

The UVIC-B backplane includes a 600-ohm audio output and four relays for control of external equipment. The level of the audio output is adjustable. The audio and relays are individually addressable, allowing each output to be activated for different events.

Use Commander or FSPWARE to assign audio and relay outputs to functions. Audio and relay outputs may be selectively programmed to be active together or individually with any control function. Program the outputs to stay on for the duration of the function, or latch on until turned off.

UVIC-B Backplane

The UVIC-B backplane provides the electrical connections between the UV+ Controller, UV400 amplifiers, and an optional UltraVoice Audio Distribution Module (UVADM).

The UVIC-B backplane provides the following:

- Four UVLOC-B interfaces.
- UVLOC-B expansion interface for eight additional UVLOC-B interfaces by using the optional UVLOC-B-EXP board.
- Sounder for audible fault alerts.
- Fault LEDs for visual indication.
- 600-ohm siren audio output.
- Four Form C relays for control of external equipment.
- Eight zones per cabinet with UVADM.
- 24-Vdc output for external equipment.
- Eight remote activation inputs.
- Six sensor inputs, including intrusion, solar, AC power, and PTT.
- AC charger interface.
- I^2C for future expansion.

Commander Software System (SFCDWARE)

Commander is software used to control, monitor, and configure the siren controller. The programming software communicates with the siren controller over the communication link. Refer to the Help menu provided with the software for operational details.

Ordering Information

Table 1 Ordering Information

Part Numbers	Description
UVIC-B1	120 Vac Integrated Controller, battery, and charger
UVIC-B2	240 Vac Integrated Controller, battery, and charger
UVIC-B1H	120 Vac Integrated Controller, battery, charger, and VHF radio (134-174 MHz)
UVIC-B1U	120 Vac Integrated Controller, battery, charger, and UHF radio (400-470 MHz) (450-512 MHz, optional)
UVIC-B1IP	120 Vac Integrated Controller, battery, charger, and IP-enabled*
UVIC-B2H	240 Vac Integrated Controller, battery, charger, and VHF radio (134-174 MHz)
UVIC-B2U	240 Vac Integrated Controller, battery, charger, and UHF radio (400-470 MHz) (450-512 MHz, optional)
UVIC-B2IP	240 Vac Integrated Controller, battery, charger, and IP-enabled*

*Requires IP Networking Software

Table 2 Ordering UVLOC-B

Part Numbers	Description
UVLOC-B	UV Local Operating Console with microphone

Table 3 Optional Accessories

Part Numbers	Description
UVLOC-B-EXP	Expansion board for eight additional UVLOC-B interfaces
DVSD	Digital voice microSD card that can store up to 4,093 voice or tone messages that total up to 17 hours of total recording time
DVR	Digital voice recording fee
UV400	400-watt Amplifier
USB Programmer	Federal Signal device that updates firmware in Federal Signal products.
FSPWARE	Federal Signal programming software (Non-digital applications)
SFCD*	Commander Software System,*10, 25, 255, or 512 Site License
Q-UVIC-LL	Telco base, landline communication interface
UVADM	UltraVoice Audio Distribution Module 25 or 70 V
ENWSSPA	Wall-mounted speaker strobe
ENWSTPA	Wall-mounted strobe
ENCSTA	Ceiling-mounted strobe
DSA1/DSA1X	100-watt speaker, tappable to 100/50/25/12 watts
MNC-MC	UVIC-B Microphone

Part Numbers	Description
MNC-MNS	UVLOC-B Microphone
155197A	12 Vdc Battery

Specifications

UVIC-B

Table 4 Electrical/Environmental for the UVIC-B

AC Input Voltage	120 or 240 Vac +/- 10% (Model dependent) 50-60 Hz
AC Input Current	120 Vac; 2 A 240 Vac; 1 A
Internal Operating Voltage	24 Vdc
Internal Operating Current	46 A DC maximum
Continuous Signaling Time	30 minutes
Battery Current	120 mA standby current, up to 20 A for each amplifier module running, 50 A
Battery Capacity	> 45 minutes continuous operation without AC power
Standby Time	> 72 hours (3 days) including two-way radio (with 5-minute full signal reserve minimum)
Battery Type	VRLA
Battery Rating	44 A/H minimum
Battery Temperature	0°F or higher/-18°C Minimum
Operating Temperature	-22°F to 120°F (-30°C to +49°C)
Humidity	0-95% non-condensing

Table 5 Enclosure

NEMA classification UVIC-B	NEMA 1 Indoor, lockable cabinet
NEMA classification UVLOC-B	NEMA 1 Indoor, lockable cabinet

Table 6 Physical

Control cabinet (H x W x D)	27 x 20.5 x 11.6 inches 68.6 x 52 x 29.5 cm
UV+ Controller, UV400 amplifier, and UVADM (H x W x D) for each	10.5 x 2.0 x 8.5 inches 26.7 x 5.1 x 21.6 cm
UV+ Controller Weight	1.2 lb (0.54 kg)
UV400 amplifier Weight	4.12 lb (1.87 kg)
UVADM Weight	6.5 lb (2.95 kg)
UVIC-B Weight (without batteries)	66 lb (29.94 kg)
UVIC-B Weight (including batteries)	133 lb (60.33 kg)
UVLOC-B Weight	5.9 lb (2.68 kg)

Refer to Federal Signal Website (http://www.fedsig.com/) for current recommended batteries. Use of batteries other than those specified may degrade the operation of this product and void the warranty.

UV+ Controller

Table 7 Signaling Formats

Number of codes	Up to 50 activation codes maximum
Two-Tone Sequential or Single Tone	282-3000 Hz 0.5 (A) - 0.25 seconds (B) minimum to 8 seconds maximum
DTMF	3 to 12 digits standard 50 ms/50 ms timing or greater
AFSK	1200,N,8,1 (MSK two-way modem)
EAS	AFSK, 520.83 baud
Modem Tones	2083.3 Hz and 1562.5 Hz

UV400 Amplifier

Table 8 Audio Power Amplifier Modules Model (UV400)

Input Voltage	24 Vdc nominal 28 Vdc maximum	
Input Current	At 24 Vdc with 1 kHz tone set to 67 V_{RMS} into 11 ohms: < 24 A	
Standby current amplifiers turned off	< 10 mA	
Efficiency	> 80%	
Output Voltage into 11 ohms at 1 KHz and 24 Vdc nominal operating voltage	67 V_{RMS} minimum	
Duty Cycle, Continuous Signaling Times	Siren Mode Digital Voice or PA	30 minutes 30 minutes (depending on signal source)
Audio distortion	< 10% – voice mode – below clipping	
Frequency response	+/- 3 dB, 300-3000 Hz	
Low Power mode	< 5 W per amplifier	
Weight	4.12 lb (1.87 kg)	

UVIC-B Backplane

Table 9 Specifications for the UVIC-B Backplane

Relay Contact Rating	8 A at 24 Vdc or 250 Vac
Relay - External Control	5 A
600-ohm Audio Input Level	0.10 to 2 V_{P-P} to make 1 V_{P-P} TP16
600-ohm Audio Output Level	0.25 to 2.0 V_{P-P}
Number of Remote Activation Inputs	8
Number of Remote Sensor Inputs	6
Input Type	Optically isolated activated by dry contact closure < 2 kilohms
Amplifier Zones	1 per amplifier without UVADM 8 total with UVADM
UVLOC-B Interfaces	4 (Up to 12 with UVLOC-B-EXP)
Fusing	F1 - Strobe relay 10 A F2 - 24 Vdc Output 10 A F3 - 24 Vdc Input 60 A, 160 Vdc F4 - 24 Vdc UVLOC-B 2 A

UVLOC-B

Table 10 Specifications for the UVLOC-B

Operating Voltage	Provided by UVIC-B
Current Draw	< 70 mA per
Input Current	less then 20 mA
Maximum Loop Line resistance	200 ohms or about 1 mile (1609 meters) for 24 gauge wire
Maximum distance between UVLOC-B and UVIC-B	Up to a mile of a single twisted-pair cable, </=200 ohms of cable
Maximum Number of UVLOC-B interfaces per UV+ Controller	4 for each UVIC-B 8 additional with optional UVLOC-B-EXP
Operating Temperature	Indoor use -30°C to 65°C (22°F to 149°F)
Humidity	0-95% Non-Condensing
Size (H x W x D)	7.1 x 11.3 x 5 inches (18 x 28.7 x 12.7 cm)

IP Interface

Table 11 Specifications for the IP Interface

Current Draw	< 150 mA
Dimensions (H x W x D)	~ 2 x 4 x 6.5 inches
Weight	< 2 lb
Protocol	IEEE 802.3, 10 Base-T connection
Audio Output Level (-17 to +2.7 dB) into 600 ohms	Adjustable from 0.30 to 3.00 V_{p-p}using R1
R1	600-ohm audio output level set
Voice Over IP	150 K baud per connection

UVADM

Table 12 Specifications for the UVADM

Zoned Audio Outputs Voltage	Selectable for 25 or 70 V_{RMS}
Operating Temperature	-30°C to 65°C (22°F to 149°F)
Humidity	0-95% Non-Condensing

UVLOC-B-EXP

Table 13 Specifications for the UVLOC-B-EXP

DC Input Voltage	20-28 Vdc, 24 Volts (nom.)
Input Current	< 200 mA DC max.
LOC Interface Architecture	600 ohms Powered Balanced line with current loop sensing
Operating Temperature	-30°C to 65°C (-22°F to 49°F)
Humidity	0-95% Non-Condensing

System Planning

Control Unit Location

The information in this section provides the you with the guidelines necessary for installation.

Consider the control unit mounting location. Mount the control unit NEMA Type 1 cabinet indoors and away from moisture, heavy dust, and contaminants. The controller contains batteries; therefore, the selected area must have adequate ventilation to prevent accumulation of explosive gas from the batteries.

A light-duty lockable latch secures entry to the cabinet.

The cabinet is suitable for wall mounting with mounting slots on 14½- to 17½-inch centers. The total weight of the control assembly, including user-provided batteries, is listed in the specification section. Ensure that the mounting surface and fasteners can safely sustain the weight of the assembly.

The control system requires a 120 Vac or 240 Vac, 50 to 60 Hz power source (model dependent).

You can use several methods to activate the UVIC-B system. Use the manual activation switches and a handheld microphone to activate the system locally. Use landline control through normally open contact switches. Make connections directly to the UVIC-B backplane terminal block. You can activate the system remotely through a radio transceiver or an external 600-ohm audio source.

If you are using radio control, consider RF coverage and antenna placement when selecting a suitable location.

If mounting a UVLOC-B, consider all items above in addition to wiring from the UVIC-B.

Speaker Location

⚠ WARNING

SOUND HAZARD: The sound output of speakers is capable of causing permanent hearing damage. Ensure people are not exposed to sounds exceeding 120 dB. Post warnings where applicable.

As a general rule, the warning signal SPL should be at least 10 dB above the ambient sound level to ensure it will be heard. Speaker fidelity and placement will also affect voice intelligibility. Review and comply with any local or state noise control ordinances as well as OSHA noise exposure regulations and guidelines.

Many factors affect the propagation of sound through barriers, over various types of materials, terrain, and changing weather conditions. Consult FEMA CPG1-17, CPG1-14 and your local Federal Signal representative for assistance to properly place your warning equipment.

Selectively turn on the speakers connected to the UVIC-B and test for proper sound.

UVLOC-B Location

Mount the UVLOC-B in an area that is readily accessible by all potential operators. Clearly mark the console to identify its location. Install out of the reach of vandals and apply any state or local noise control ordinance.

Connect up to four UVLOC-B interfaces to each UVIC-B (eight additional with optional UVLOC-B-EXP). Place the consoles up to 1 mile from the UVIC-B. Wall mount the console approximately 5 feet above the ground. Mount the UVLOC-B as far as possible from the speaker locations to reduce the potential for audio feedback during a live PA announcements.

The UVLOC-B requires a single twisted-pair cable run between the UVIC-B and the UVLOC-B. A connector is provided on the UVLOC-B interface board for making connections.

Installation

⚠ DANGER

SHOCK HAZARD: Electrocution or severe personal injury can occur when making electrical connections, drilling holes, or lifting equipment. Therefore, experienced electricians, in accordance with national and local electrical codes, acting under the direction of the installation crew safety foreman, should perform installation.

EXPLOSION HAZARD: Explosive gases and corrosive materials may be present. To prevent explosion or severe personal injury, installation technicians must be experienced with the safe installation of lead-acid type batteries.

⚠ WARNING

SOUND HAZARD: The output level of high-powered speakers is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan placement of siren and post warnings. To prevent excessive exposure to installers and service personnel, adequate measures must be taken to ensure that the sirens are not activated while they are within 150 feet of the speaker array or provide proper ear protection.

Figure 1 Typical UVIC-B Installation Drawing

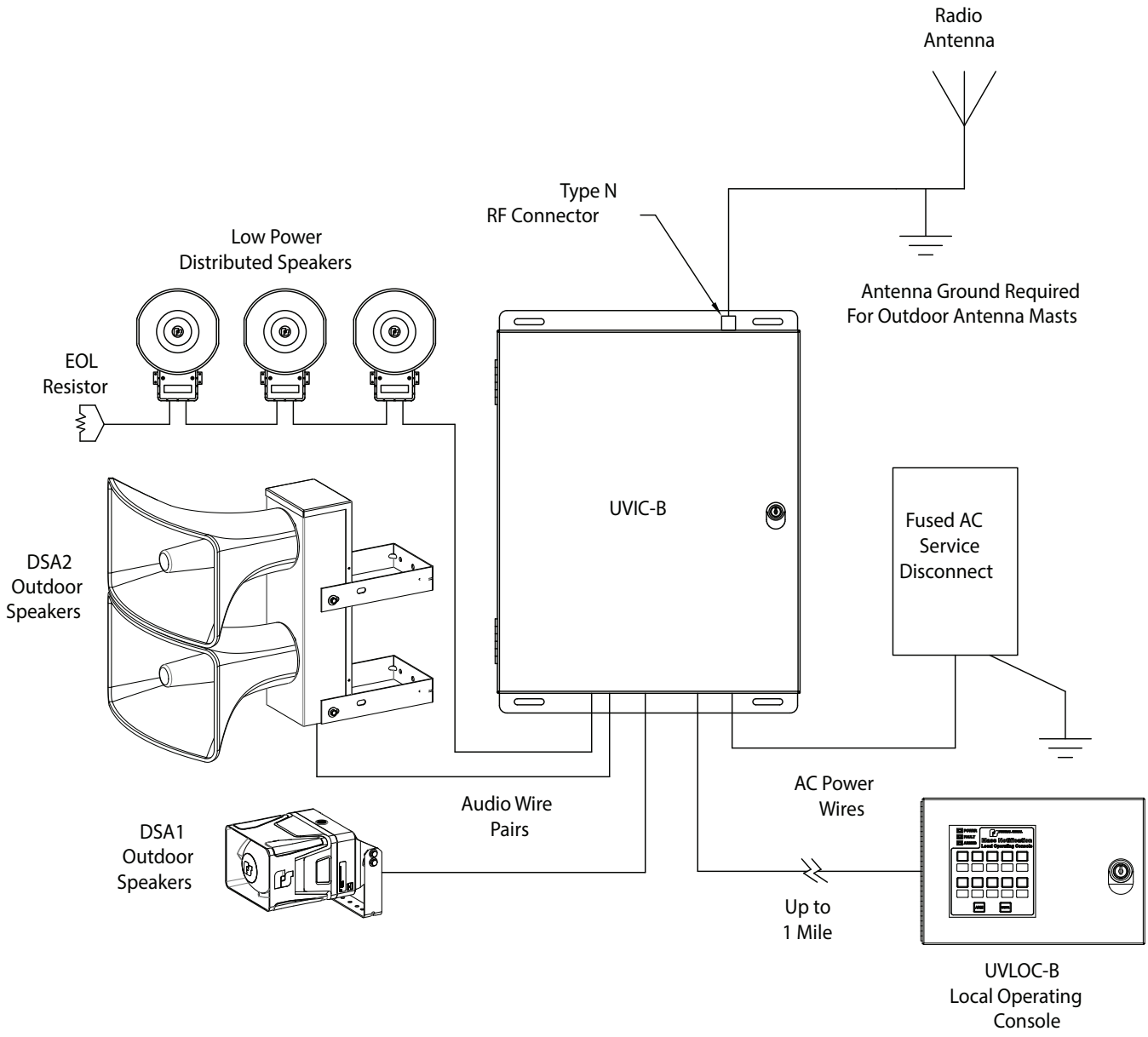


Figure 2 UVIC-B Cabinet Dimensions

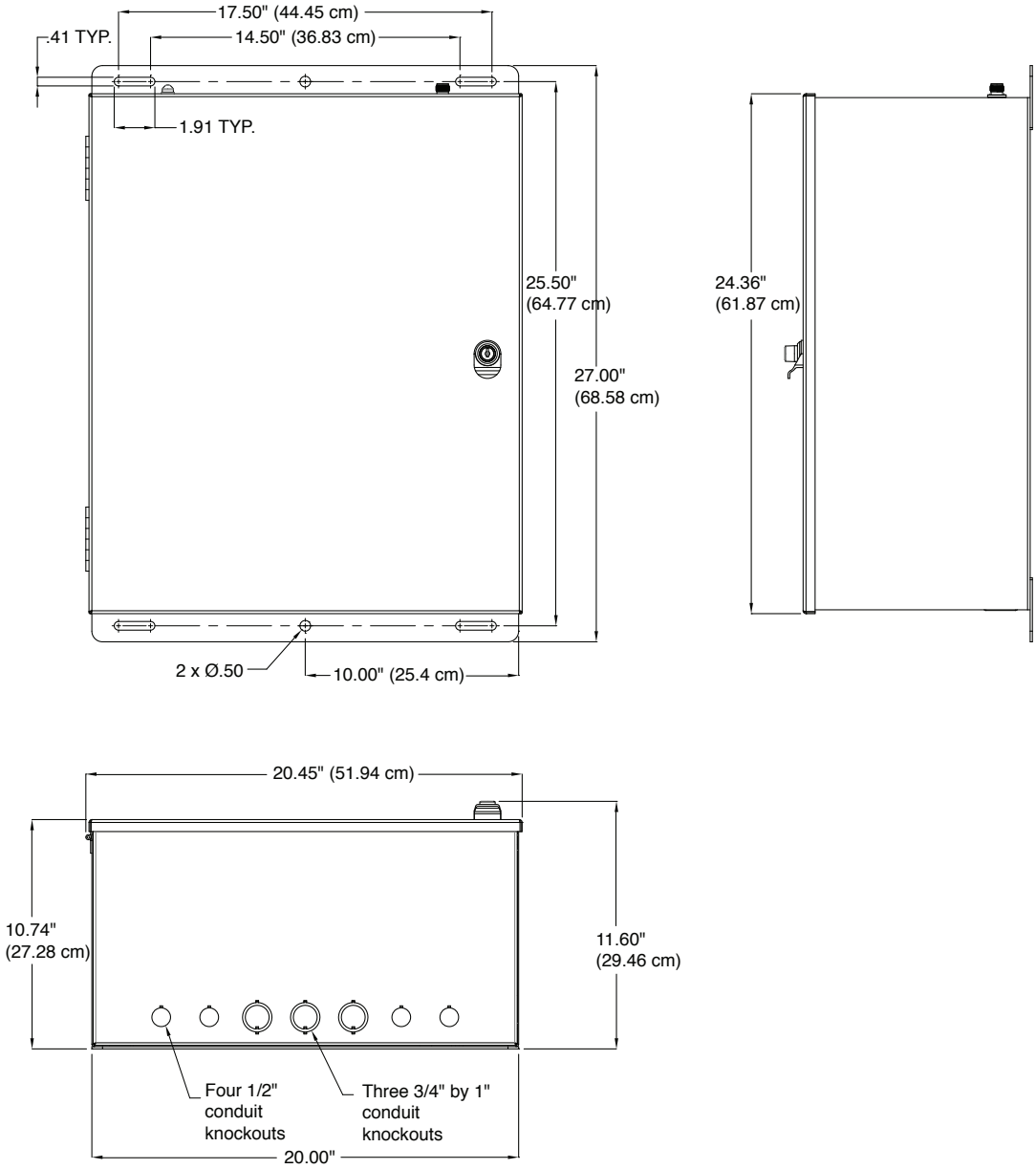
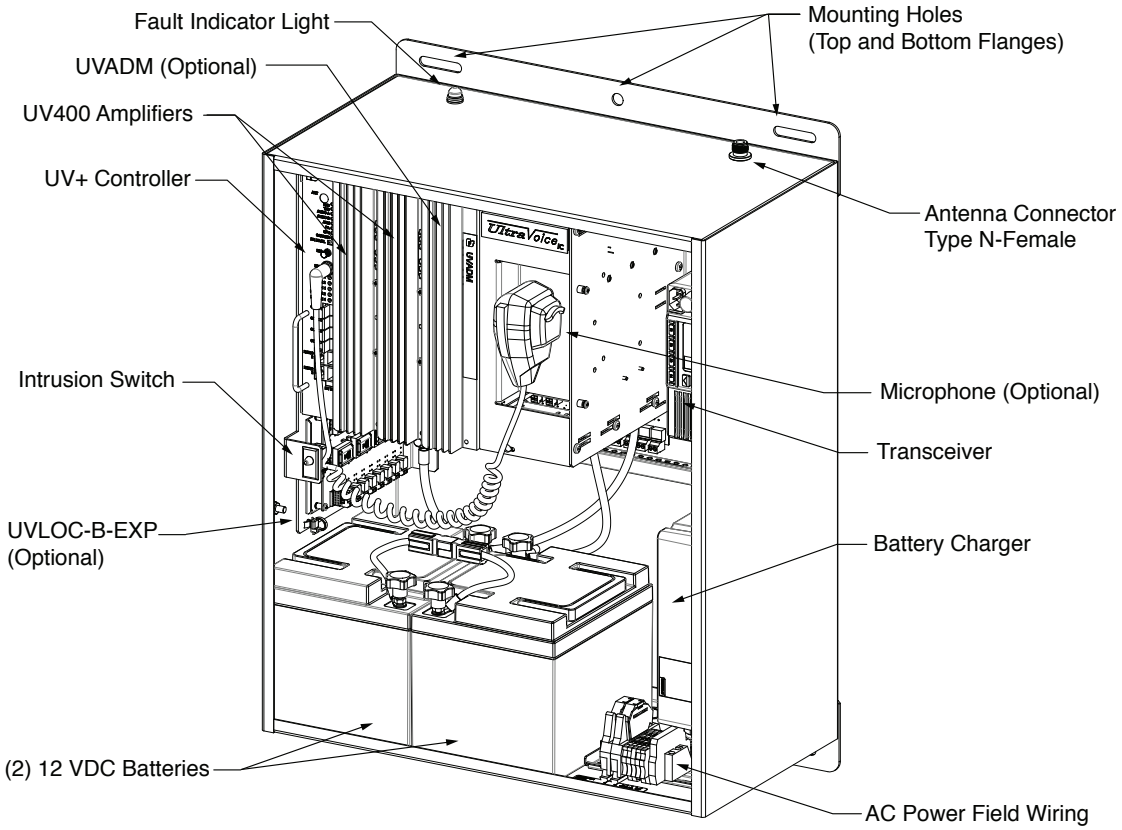


Figure 3 UVIC-B Parts Layout



NOTE: Cabinet Door is not shown.

General Mounting Guidelines For All Applications

These general installation instructions are pertinent to all installations. Specific mounting methods and required installation materials are described in the next section.

1. There are three pre-drilled holes in each of the cabinet mounting flanges. (See “Figure 2 UVIC-B Cabinet Dimensions” on page 22.) Depending on the mounting surface, mount the cabinet using either of the following sets of holes:

- (2) Centered 0.41-inch diameter mounting holes
- (4) Mounting slots 0.41 by 2 inches with 14½- to 17½-inch centers

2. The total weight of the UVIC-B cabinet with batteries is listed in the Specifications section. It is imperative that the mounting surface and mounting method selected can safely sustain the weight of the assembly.

NOTE: To reduce the weight of the cabinet during installation, do not install the batteries before mounting the cabinet.

3. Prepare the mounting surface for hanging the cabinet by predetermining the location of the mounting holes. Attach the cabinet to a wall or other substantial vertical surface using the four 0.41 inch mounting slots. Alternatively, use the two center mounting holes alone, if securely lagged directly into a wood stud or other vertical surface capable of handling the weight load.

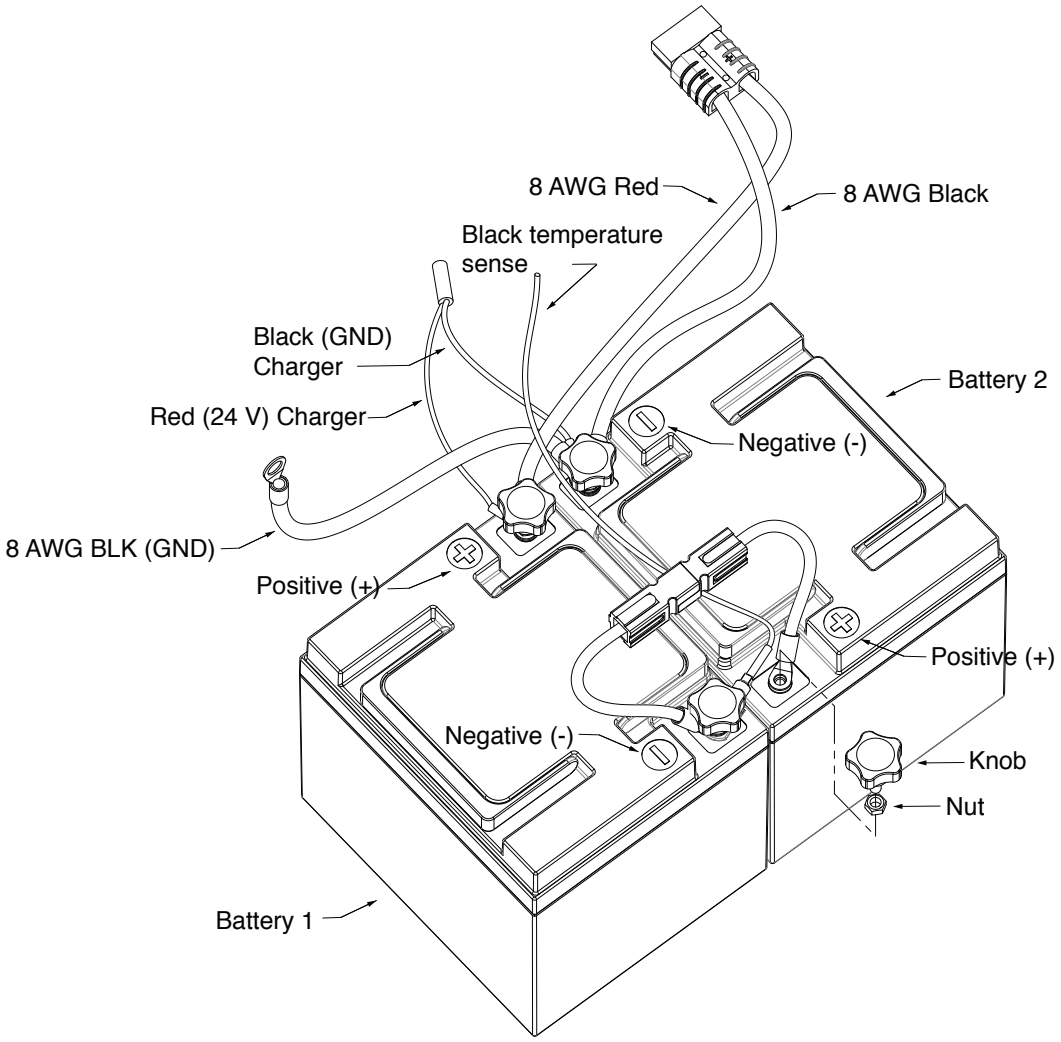
If the mounting surface is not flat, the cabinet may require shimming to keep the cabinet square.

4. Guidelines for various attachment methods to accommodate different wall types are described in the following section. Make provisions for spacing behind the cabinet when mounting to an exterior wall that is susceptible to condensation or other surface moisture.

5. With the two batteries removed, use two people to lift the cabinet to the desired mounting height and lag to the wall using the prepared holes and anchors.

6. After the cabinet is securely mounted, remove any debris that may have entered the cabinet. Install the batteries oriented as shown in Figure 4, but do not connect any wires to the batteries.

Figure 4 UVIC-B Battery Connections



7. If the UVIC-B model being installed has a two-way radio, ensure the radio power switch is turned off until all wiring is completed to avoid damaging the radio.

Battery Charger

The battery charger monitors battery conditions, temperature and varies charge rate. It is a multi-stage charger that charges both batteries simultaneously. The two batteries add up in series to give the 24 Vdc required for controller operation. See “Figure 4 UVIC-B Battery Connections” on page 24.

The following table describes the wire connections on the charger.

Table 14 Wiring Connections for the Charger

Wire	Connections
AC power wires black/green/white	Connect to AC power at the DIN rail terminal blocks.
Black temperature sense	Connects to Battery 1 (negative).
White/black/black wires	Connect three wires from the battery charger to JP36 on the UVIC-B backplane.
Black/red wires	Black wire connects to Battery 2 (negative). Red wire connects to Battery 1 (positive).

UVIC-B Installation Material List and Installation Guidelines

The following material lists and guidelines describe basic installation details required to install the UVIC-B cabinet. This list varies depending on mounting methods, other options, local and national electrical codes. Use lists as a reference guide only.

Table 15 Installer Supplied UVIC-B Electrical Installation Material List

Material Description	Purpose	Qty
30 A/250 V/ 2 Pole Solid Neutral/ Fused Disconnect with Ground Kit/ NEMA 1 Rating/ Lockable Cover Tang/ Lockable Operator	Optional Electrical Disconnect	1
15 A FRNR Fuse	Fuses for 120 V Service	1
10 A FRNR Fuse	Fuses for 240 V Service	2
12-14 AWG White Wire	AC Neutral from disconnect	8 ft
12-14 AWG Black Wire	AC Load from disconnect	8 ft
12-14 AWG Green Wire	Equipment ground from disconnect	8 ft
1/2 inch Seal Tight Conduit and Fittings	Electrical conduit from disconnect	5 in
Metal Ground Bushings	Equipment ground connections	2
Screws, appropriate to mounting surface	Disconnect mounting	4
15 A Breaker	Service panel breaker serving unit	1
White Wire appropriately sized	AC neutral from breaker panel to disconnect	Varies
Black Wire appropriately sized	AC load from breaker panel to disconnect	Varies
Green Wire appropriately sized	Equipment ground from breaker panel to disconnect	Varies
Conduit and fittings, appropriately type and size for particular installation requirements	Electrical conduit from breaker panel to disconnect	Varies

Material Description	Purpose	Qty
#6 Stranded	Cabinet ground to earth ground for external antenna applications	Varies

Concrete or Filled Cement Block Wall Mounting Guidelines

Table 16 Concrete or Filled Cement Block Wall Mounting Materials

Material Description	Purpose	Qty
3/8 x 3 inch Pin/Sleeve/Lock Washer/Nut Style Anchors	Anchor Bolts	4

1. Mark the mounting hole locations on the wall for the cabinet.
2. Install the anchor bolts for the four cabinet corners according to the manufacturer's instructions.
3. Mount the cabinet to the wall.
4. Proceed to following section.

NOTE: If the wall is not straight, use shims to ensure that the enclosure maintains square and structural integrity.

Hollow Block Wall Mounting Guidelines

Table 17 Hollow Block Wall Mounting Materials

Material Description	Purpose	Qty
3/8 x 4 inch Heavy Duty Toggle Bolts	Anchor Bolts	4

1. Mark the mounting hole locations on the wall for the cabinet.
2. Install the anchor bolts for the four cabinet corners according to the manufacturer's instructions.
3. Mount the cabinet to the wall.
4. Proceed to following section.

Wood Stud Wall Mounting Guidelines

Table 18 Wood Stud Wall Mounting Materials

Material Description	Purpose	Qty
3/8 x 3 inch Lag bolts	Backboard and cabinet mounting bolts	8
24 x 36 x 3/4 inch B/C or better plywood	Mounting backboard	1
Construction adhesive	Mounting backboard attachment	1

1. Locate the wall studs for attaching the mounting backboard to the wall. Attach the backboard to at least two studs.
2. Mark the wall stud location on the mounting backboard and drill four pilot holes for the 3/8-inch lag bolts.
3. Apply construction adhesive to the back of the mounting backboard.

4. Attach the mounting backboard to the wall with four 3/8- by 3-inch lag bolts.
5. Locate the mounting position of the cabinet on the mounting backboard.
6. Drill pilot holes for the 3/8- by 3-inch lag bolts.
7. Mount the cabinet to the mounting backboard.
8. Proceed to the following section.

Metal Stud Wall Mounting Guidelines

Table 19 Metal Stud Wall Mounting Materials

Material Description	Purpose	Qty
3/8 x 3 inch Lag bolts	Cabinet mounting bolts	4
24 x 32 x 3/4 in B/C or better plywood	Mounting backboard	1
#10 x 3 inch metal stud screws	Backboard mounting	12
Construction adhesive	Backboard mounting	1

1. Locate the wall studs for attaching the Mounting Backboard to the wall.
2. Mark the wall stud location on the mounting backboard and drill pilot holes for the #10 by 3 inch metal stud screws. Place six screws in each stud evenly spaced apart.
3. Apply construction adhesive to the back of the mounting backboard.
4. Attach the mounting backboard to the wall with #10 by 3 inch metal stud screws.
5. Locate the mounting position of the cabinet on the mounting backboard.
6. Drill pilot holes for the 3/8 by 3 inch lag bolts.
7. Mount the cabinet to the mounting backboard.
8. Proceed to the following section.

Electrical Connections

⚠ WARNING

ELECTRICAL HAZARD: Install the siren electrical system in compliance with local electrical codes and NEC recommendations. Federal Signal recommends that all user-installed conduit connections enter from the bottom of the UVIC-B cabinet using the supplied conduit knockouts. Disconnect all power and read all warnings at the beginning of this manual and on the batteries before making connections.

The UVIC-B cabinet must be properly connected to an earth ground. A DIN rail mounted grounding block is provided inside the UVIC-B enclosure.

If an outdoor antenna is used, install a separate antenna ground. Externally installed antennas require a dedicated ground to either a ground rod or building steel below grade in addition to the UVIC-B cabinet ground.

⚠ CAUTION

Verify the AC voltage requirement for the UVIC-B model being installed. 240 Vac versions of the UVIC-B controllers have a "240" suffix in the model number shown on the label located on the cabinet door. All other UVIC-B models are to be wired to 120 VAC.

DIN Rail Terminal Blocks

These points provide a convenient location for making electrical connections. Push a small screwdriver into the square opening in the terminal block to open the contact of the block. With the wire inserted, the block clamps the wire with a spring-loaded connection when the screwdriver is removed from the terminal block.

Each terminal block accepts bare 12-14 AWG wire. The two fused terminal blocks labeled F1 and F2 have a built-in disconnect that flips open, disconnects the circuit, and provides access to the fuse located inside the terminal block.

Wiring Guidelines for the 120 Vac Electrical Service

To wire for the 120 Vac electrical service:

1. Install a dedicated 15 A circuit breaker in an existing breaker panel or install a new breaker panel if necessary for the UVIC-B.
2. Install conduit from the breaker panel to a conduit entrance in the bottom of the UVIC-B cabinet.
3. Route user-supplied 12-14 AWG wires (1 black, 1 white, 1 green) through the conduit from the UVIC-B cabinet and the fused breaker panel.
4. Connect the white neutral wire from the breaker panel neutral to the fused DIN rail mounted terminal block labeled F1-NEUTRAL in the UVIC-B cabinet.
5. Connect the black line wire from the 15 A breaker to the DIN rail mounted terminal block labeled F2-Line in the UVIC-B cabinet.
6. Connect a green ground wire from the breaker panel earth ground to the green ground block in the UVIC-B cabinet.
7. To avoid shorting the output of the charger, do not apply AC power before making the battery connections described later in this section.

Wiring Guidelines for the 240 Vac Electrical Service

To wire for the 240 Vac electrical service:

1. Install a dedicated 15 A two-pole circuit breaker in an existing breaker panel or install a new breaker panel if necessary for the UVIC-B.
2. Install conduit from the breaker panel to a conduit entrance in the bottom of the UVIC-B cabinet. Ensure the conduit is adequately grounded.
3. Route user-supplied 12-14 AWG wires (2 black, 1 green) through the conduit from the UVIC-B cabinet and the fused breaker panel (or as otherwise specified by code).
4. Connect one line wire from the 15 A breaker panel to the fused DIN rail mounted terminal block labeled F1--L1 in the UVIC-B cabinet.

5. Connect the other line wire from the 15 A breaker to the DIN rail mounted terminal block labeled F2--L2 in the UVIC-B cabinet.
6. Connect a green ground wire from the breaker panel earth ground to the green ground block in the UVIC-B cabinet.
7. To avoid shorting the output of the charger, do not apply AC power before making the battery connections described later in this section.

Battery Connections

⚠ DANGER

ELECTROCUTION HAZARD: When installing or removing batteries, take care to avoid shorting battery terminals to metal surfaces. Failure to do so could result in serious personal injury or death. Batteries miswired can cause serious personal injury or death. Read and understand the following information before making actual connections.

NOTE: The charger comes from the factory preset for float voltage of 13.5 Vdc per battery. This preset works with Federal Signal supplied batteries. Some batteries may recommend a different float voltage, the charger can be set from 13.2 to 13.8 Vdc per battery (actual voltage is 26.4 to 27.6 Vdc). If the battery float voltage requires adjustment, remove the cover on the charger and change the JP7 jumper to the appropriate settings.

See “Figure 4 UVIC-B Battery Connections” on page 24.

To connect the battery:

1. The battery disconnect plug is located behind the cover plate on the right side of the amplifiers. Disconnect the battery cable from the UVIC-B backplane by grasping the black connector with the large 8 AWG red and black wires and unplugging it from the UVIC-B backplane.
2. Open the fastener kit provided in the UVIC-B cabinet containing the plastic battery terminal knobs and spacer nuts. Replace the battery terminal bolts provided with the battery with the terminal knobs and nuts provided in the fastener kit.
3. Connect the wires to the batteries connecting the short black 8 AWG wire between batteries 1 and 2 last. Use an anti-oxidant compound to protect the terminals.
4. Verify the battery connections are tightened securely to make proper electrical connections.

Installing the Antenna

Determine type of antenna to be installed:

- Cabinet Mounted Magnetic Base
- Remote Mounted Magnetic Base
- Yagi external antenna type
- Omni external antenna type

For installation instructions on the Yagi and Omni Antennas go to the Federal Signal’s website.

Installing the Cabinet Mounted Magnetic Base Antenna

If the UVIC-B is being installed in a very good RF coverage area, you may use a cabinet Mounted Magnetic Base antenna.

To install the cabinet mounted magnetic base antenna:

1. Connect the antenna cable to the antenna connector on the top of the UVIC-B cabinet.
2. Mount the magnetic antenna base on the top of the UVIC-B cabinet.

Installing the Remote Mounted Magnetic Base Antenna

The Remote Magnetic Base antenna allows for additional antenna height to improve reception.

To install the remote mounted magnetic base antenna:

1. Locate a suitable location for the antenna that is away from any electrical devices, high voltage and computer wiring. Locate as high as possible to enable the antenna mast to be at least 2 feet away from any grounded metal objects.
2. Mount the antenna to a flat, secure metal structure with at least 225 square inches (1.5 square foot area) that the Magnetic Mount will securely stick to.

Connections for the UVIC-B Backplane (Figure 5)

Speaker Connections (JP2, JP9, JP10, JP17, JP18, JP21, JP22, JP23)

The speaker connections are located on the bottom right-hand side of the UVIC-B backplane. There are 8 two-position removable connectors for each of the zones enabling up to eight pairs of wires to be connected to the UVIC-B controller.

If you are not using the UVADM, Amplifier 1 provides 400 watts at 70 V_{RMS} to zones 1-4 connectors. Amplifier 2 provides power to zones 5-8. You may connect up to 400 watts of speaker loads across the 70 V line for each amplifier.

If you are using the UVADM, the module allows for 8 zone outputs. For each zone, you can set the output switch to either 25 or 70 V_{RMS} and set the amplifier selection switch to either Amplifier 1 or Amplifier 2. Each output is monitored for line integrity (through the use of a 2.7 kilohms end-of-line resistor) and for ground faults. Line monitoring requires that each speaker be capacitively isolated and a 2.7 kilohms end-of-line resistor is required across the farthest speaker.

If you need to use multiple separate speaker wire runs for the installation, use an external speaker wire junction box to simplify field wiring and limit the number of wires in the UVIC-B cabinet.

UVLOC-B or 600-ohm port selection (JP6)

If using UVLOC-B: short pins 1 and 3; 2 and 4. If using 600-ohm input (JP12): do not short any pins.

Battery Connection (JP5)

Use JP5 to disconnect the battery cable from the UVIC-B backplane. Fuse 3 is directly below JP5.

24 Vdc Power (JP7)

The 24 Vdc output can provide power for external equipment. Typical use if for DC-DC converters when powering 12 Vdc radios, IP devices or land-line interfaces.

Slot 4 (JP8)

Slot 4 requires either a bypass board or a UVADM. The bypass board is used when 70 V speakers are being used (typically DSA1, DSA2/4/6 or the Modulator sirens) and the outputs do not need to be switched on in zones. If 25 V speakers are being used, the bypass board is removed and a UVADM board is inserted.

Strobe Output (JP11)

Future use.

600-ohm Input/Output (JP12)

JP12 can be used for multiple functions. It can be used as an input, an output, or for an input and output port.

If the UVLOC-B option is being used, this JP12 is not available. See JP6 on “Table 21 Configuration Jumpers for the UVIC-B Backplane” on page 35 for the correct jumper settings on the UVIC-B backplane.

JP12 can be used for an external audio input with PTT. Connect the external audio for PA announcements to the 600-ohm port on the UVIC-B backplane at JP12. A contact closure (for example, PTT) is required at JP15 to enable the 600-ohm input. For best results, use a twisted-pair audio grade cable and a well-filtered audio source. Keep the cable length as short as possible and away from sources of electrical noise. See “600-ohm Level Adjustment Procedure for Communications” on page 46.

JP12 can be used to output siren audio to an external audio device, for example an amplifier.

JP12 can also be used as both an input and output port, for example when using an external device to control the system. JP12 is used for activation and status monitoring of the UVIC-B over direct connection (SS2000+, landline, etc.)

Filtered 24 Vdc Supply (JP13)

The UVIC-B backplane can supply a filtered 24 Vdc at up to 5 A for powering external equipment.

Remote Activation Inputs (JP14)

Terminal block JP14 at the bottom of the UVIC-B backplane is the Remote Activation Inputs. Optionally, you can operate the UVIC-B controller by wired relays or buttons. Use terminal block JP14 for external interface equipment.

You can activate functions F1 through F7 by providing momentary, dry contact closure between COM and the desired JP14 terminal. Shorting F1 to COM activates whatever is programmed for code #1, shorting F2 to COM activates whatever is programmed for code #2, and so on. A half-second momentary contact duration is required.

To terminate an activated signal before it runs for the full duration: provide a momentary contact closure between JP14 COM and F8 (RESET).

NOTE: No matter how F8 is programmed, F8 is a master reset or a stop switch.

Sensor Inputs (JP15)

Terminal block JP15 is located at the bottom of the UVIC-B backplane. Use sensor inputs to detect and notify conditions occurring at an RTU location.

Spare 1 and 2 (JP15: pins 1 and 2)

Use for user-defined application.

Intrusion (JP15: pins 3 and 4)

Alerts the controller when one of the unit's doors has been opened. Low is intrusion pass.

Solar (JP15: pins 5 and 6)

Use to sense operation of solar power system.

Jumper JP15: pins 5 and 6 when using solar. This jumper enables solar mode, which causes the system not to report a failure during low-light conditions or at nighttime. This is done by locking in a power pass until a master reset. For solar panel testing during the day, initiate a master reset, wait 15 seconds, and then poll.

AC Power/Solar (JP15: pins 7 and 8)

Jumper JP15 pins 7 and 8 when using solar only. If using AC, 7 and 8 are connected to AC power sensor.

600-ohm PTT (JP15: pins 9 and 10)

Shorting pins 9 and 10 puts the UV+ Controller in local PA mode.

User-Defined Application (JP15: pins 11 and 12)

Use spare JP15: pins 11 and 12 for user-defined application.

Isolated Power Supply (JP16)

The UVIC-B backplane can supply +5 Vdc for external use up to 150 mA.

Test Speaker (JP19)

The test speaker output provides a ½-watt output for an external speaker. The speaker will play audio from the receiver or transceiver if one is connected. This is used to listen to the received audio to determine if it is being received and how noisy it is.

Fault LED (JP20)

The fault LED output activates an external LED to indicate a fault has occurred on the system. If the UVIC-B system is used in standalone mode, the LED indicators can be used to troubleshoot the system. LED D25 on the UVIC-B backplane will illuminate to indicate a fault. In addition, sounder S1 can be enabled to provide an audible alert.

Faults detected include:

- Strobe Output JP11 (future) is monitored for open, shorted, or grounded faults. An end-of-line resistor is required. Removing JP28 disables sensing this fault.
- UVLOC-B lines (JP25, JP26, JP27, and JP39) are monitored for open, shorted or ground faults. Remove JP32, JP33, JP34, and JP35 respectively to disable sensing these faults.

If the UVADM is used, lines to speaker zone outputs on JP2, JP9, JP10, JP17, JP18, JP21, JP22, and JP23 can be monitored for open, shorted, grounds using an end-of-line resistor.

Remove JP8, JP7, JP6, JP5, JP4, JP3, JP2, and JP1 respectively on the UVADM to disable sensing these faults.

If the UVIC-B system detects a ground fault, the ground fault LED D15 will light on the UVIC-B backplane.

If the UVIC-B system detects a short or open, the line fault LED D14 will light on the UVIC-B backplane.

The UVIC-B system will also provide a fault indication for battery voltage, amplifier faults, Audio A and B, AC power failures, charger faults and microSD card. Commander control software can be used to query (poll) the system for fault conditions.

UVLOC-B Interface (JP24, JP25, JP26, JP27)

These two-pin connectors are to interface UVLOC-B panels. Use twisted-pair cable. See JP32, JP33, JP34, JP35 in Table 21 to enable.

NOTE: For UVLOC-B operation, verify UV+ Controller has JP6 set for PA mode: jumper across pins 1 and 2.

Relay Connections (JP29)

Connections to the relays are made on the UVIC-B backplane located behind the microphone holder. All relays are labeled on the UVIC-B backplane.

600-ohm Siren Audio Output Channel (JP30)

JP30 selects which audio channel, A or B, is sent through JP39. Jumpering pins 1 and 2 selects channel A. Jumpering pins 2 and 3 selects channel B.

I^2C interface (JP38)

The I^2C interface is for future expansion/features.

600-ohm Siren Audio Output Balanced (JP39)

JP39 outputs the audio that is sent to the amplifiers. It can be used to drive external PA amplifiers.

The following tables provide the connectors and descriptions for connecting to the UVIC-B backplane.

Table 20 Connectors for the UVIC-B Backplane (Figure 5)

JP1	UV+ Controller Module Slot
JP2	Zone # 1 Audio Output Pins:1 (+), 2 (-)
JP3	UV400 Amplifier 1
JP4	UV400 Amplifier 2
JP5	24 Vdc Battery Input
JP7	Unfiltered 24 Vdc Output Pins: 1 (+), 2 (-)
JP8	UVADM Module Slot
JP9	Zone # 2 Audio Output Pins: 1 (+), 2 (-)
JP10	Zone # 3 Audio Output Pins: 1 (+), 2 (-)
JP11	Strobe Relay Output: monitored and powered Pins: 1 (-), 2 (+24 Vdc)

<table>
<tr><td>JP12</td><td>600-ohm Audio I/O
<table>
<tr><th></th><th>UVIC-B Backplane JP6</th><th>UV+ JP6</th><th>UV+ JP7</th></tr>
<tr><td>UVLOC-B Operation</td><td>Short Pins 1 and 3; 2 and 4</td><td>Short Pins 1 and 2</td><td>Remove all jumpers</td></tr>
<tr><td>Use JP12 for audio in with PTT</td><td>Remove all jumpers</td><td>Short Pins 1 and 2</td><td>Remove all jumpers</td></tr>
<tr><td>Use JP12 to control UVIC-B</td><td>Remove all jumpers</td><td>Short Pins 2 and 3</td><td>Short Pins 2 and 3</td></tr>
<tr><td>Use JP12 as 600-ohm audio output</td><td>Remove all jumpers</td><td>Remove all jumpers</td><td>Short Pins 1 and 2</td></tr>
</table></td></tr>
<tr><td>JP13</td><td>Filtered 24 Vdc Power Output Pins: 1 (-), 2 (+)</td></tr>
<tr><td>JP14</td><td>Remote Activation Input
Pins: 1,10 ISO Ground
<table>
<tr><td>Pin</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
<tr><td>Function</td><td>F1</td><td>F2</td><td>F3</td><td>F4</td><td>F5</td><td>F6</td><td>F7</td><td>F8</td></tr>
</table></td></tr>
<tr><td>JP15</td><td>Sensor Inputs
Pins:
1,3,5,7,9,11 ISO Ground
2 Spare #1
4 Intrusion
6 Solar Charger
8 AC Power
10 600-ohm PTT
12 Spare #2 (Solar Mode)</td></tr>
<tr><td>JP16</td><td>Isolated Power Supply Pins: 1 (-), 2 (+)
- 150 mA maximum current for external equipment</td></tr>
<tr><td>JP17</td><td>Zone # 4 Audio Output Pins: 1 (+), 2 (-)</td></tr>
<tr><td>JP18</td><td>Zone # 5 Audio Output Pins: 1 (+), 2 (-)</td></tr>
<tr><td>JP19</td><td>Test Speaker (Listen to receive audio)
Pins: 1 Receive Audio, 2 Ground</td></tr>
<tr><td>JP20</td><td>Fault LED Output
Pins:
1 +5 Vdc
2 Switched low during a Fault condition</td></tr>
<tr><td>JP21</td><td>Zone # 6 Audio Output Pins: 1 (+), 2 (-)</td></tr>
<tr><td>JP22</td><td>Zone # 7 Audio Output Pins: 1 (+), 2 (-)</td></tr>
<tr><td>JP23</td><td>Zone # 8 Audio Output Pins: 1 (+), 2 (-)</td></tr>
<tr><td>JP24</td><td>LOC Interface # 1</td></tr>
<tr><td>JP25</td><td>LOC Interface # 2</td></tr>
<tr><td>JP26</td><td>LOC Interface # 3</td></tr>
<tr><td>JP27</td><td>LOC Interface # 4</td></tr>
</table>

JP29	Relay Outputs Pins: <table><tr><th>Relay</th><th>Common</th><th>Normally Open</th><th>Normally Closed</th></tr><tr><td>1</td><td>1</td><td>2</td><td>3</td></tr><tr><td>2</td><td>4</td><td>5</td><td>6</td></tr><tr><td>3</td><td>7</td><td>8</td><td>9</td></tr><tr><td>4</td><td>10</td><td>11</td><td>12</td></tr></table>
JP31	UVLOC-B Expansion Interface
JP36	Battery Charger Interface
JP38	I^2C interface
JP39	600 ohm Siren Audio Output Balanced

Table 21 Configuration Jumpers for the UVIC-B Backplane

JP6	UVLOC-B or 600-ohm port selection If using UVLOC-B: short pins 1 and 3; 2 and 4 If using 600-ohm (JP12) for anything other than UVLOC-B: do not short any pins
JP28	Strobe Line Fault Monitoring enable
JP30	600-ohm Siren Audio Output Channel
JP32	LOC Port # 1 enable
JP33	LOC Port # 2 enable
JP34	LOC Port # 3 enable
JP35	LOC Port # 4 enable
JP37	Fault Sounder enable

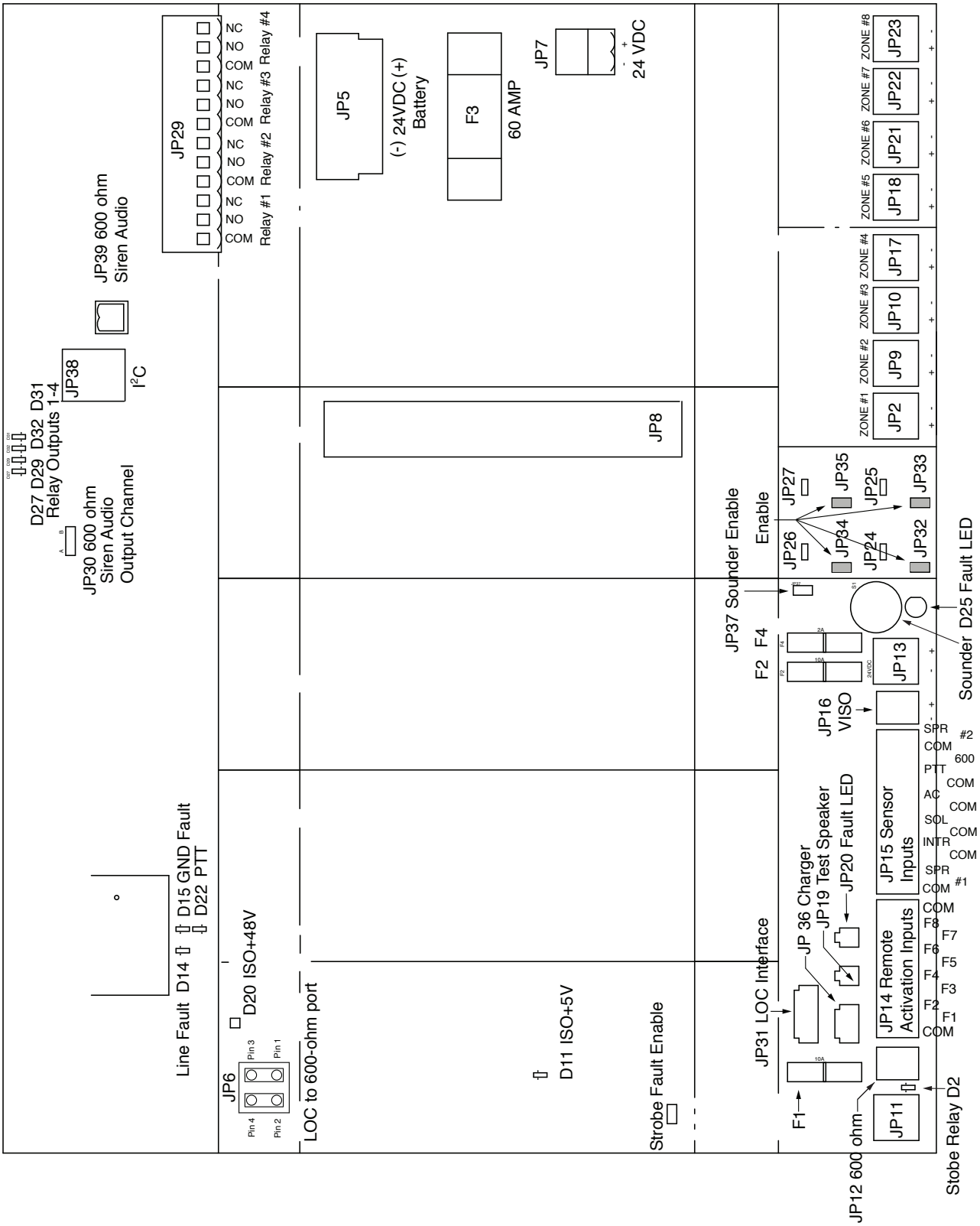
Table 22 Indicators for the UVIC-B Backplane

D2	Strobe Relay Output LED
D11	Isolated +5 V
D14	LOC Line Fault
D15	LOC GND Fault
D20	Isolated +48 V
D22	PTT
D25	Fault Condition
D27	Relay Output #1
D29	Relay Output #2
D32	Relay Output #3
D31	Relay Output #4

Table 23 Fuses for the UVIC-B Backplane

F1 - Strobe Relay Fuse at JP11	10 A, 32 Vdc
F2 - 24 Vdc Output at JP13	10 A, 32 Vdc
F3 - 24 Vdc Input at JP5	60 A, 160 Vdc
F4 - 24 Vdc LOC Interface power	2 A, 32 Vdc

Figure 5 Connections for the UVIC-B Backplane



Optional UVLOC-B and UVLOC-B-EXP Connections and Wall Mounting

The UVIC-B backplane includes four jacks to connect to individual UVLOC-B units. The UVIC-B backplane includes a connector to interface to an optional UVLOC-B-EXP board that allows you to expand from four interfaces to an additional eight UVLOC-Bs for a total of twelve UVLOC-B interfaces.

Verify the following for the UVLOC-B and UVLOC-B-EXP connections:

- The UVLOC-B requires a single twisted-pair cable between the UVLOC-B and the UVIC-B backplane or the interface board (UVLOC-B-EXP).
- Verify JP32, JP33, JP34, and JP35 are enabled if UVLOC-B fault detection is required.
- If using UVLOC-Bs, short pins 1 and 3; 2 and 4 at JP6 on the UVIC-B backplane.
- The UVLOC-B-EXP board attaches to the left side of the control cabinet or right side of the UVIC-B card cage.
- See Figure 8 for the UVLOC-B mounting hole locations. The UVLOC-B is typically mounted on a wall approximately 5 feet (30.48 cm) above the ground.
- Label the UVLOC-B to ensure the operators know what messages and functions are available.
- For UVLOC-B operation, verify UV+ Controller has JP6 set for PA mode: jumper across pins 1 and 2. JP7 has no jumpers.

Figure 6 UVLOC-B-EXP and UVLOC-B Connections

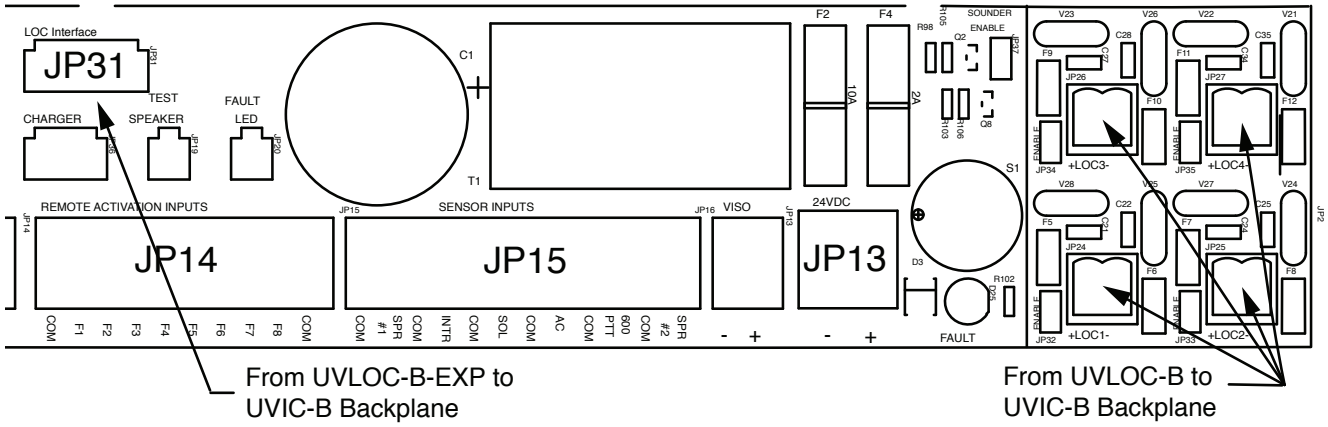


Figure 7 UVLOC-B Dimensions

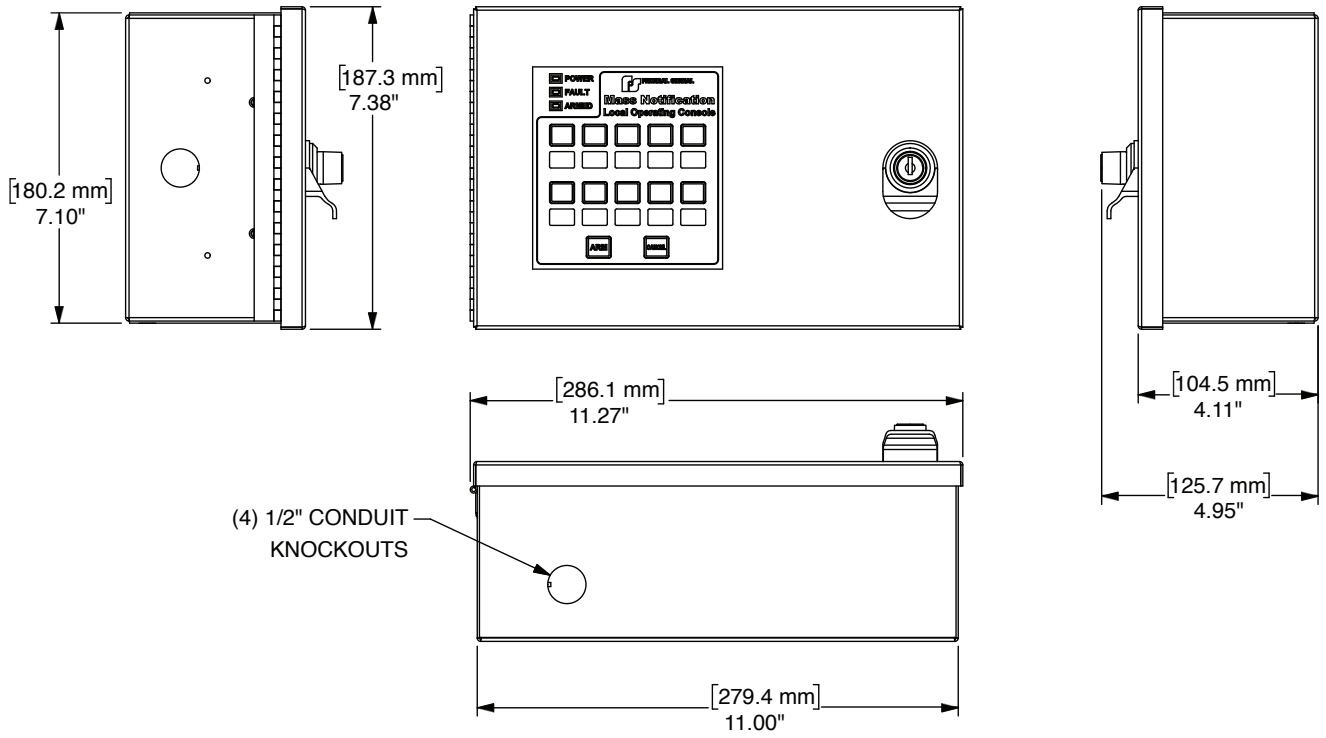
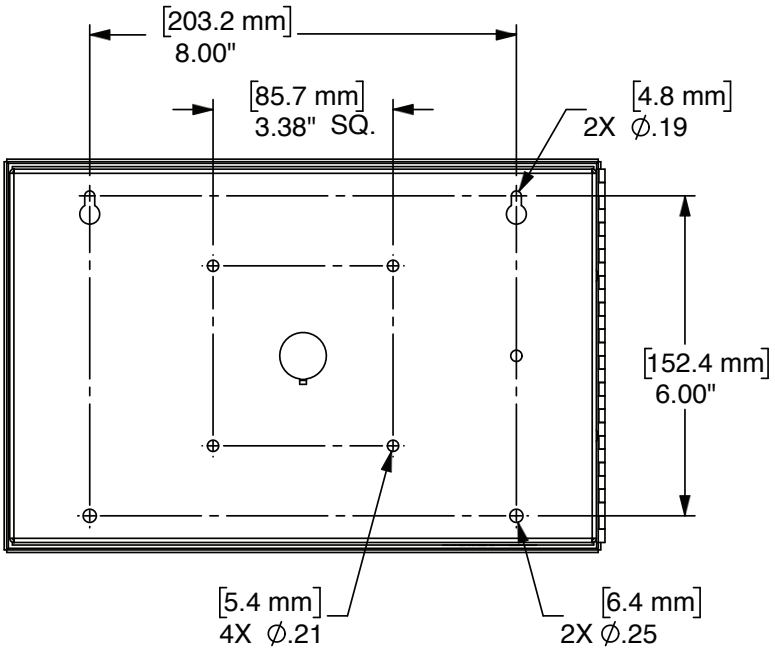


Figure 8 Back of UVLOC-B Dimensions



Connections for the UVLOC-B

The following tables provide the connectors, jumpers, and indicators for the UVLOC-B. Access to the UVLOC-B control board requires opening the enclosure and removing the metal cover inside the enclosure.

NOTE: For UVLOC-B operation, verify UV+ Controller has JP6 set for PA mode: jumper across pins 1 and 2.

Table 24 Connectors for the UVLOC-B

JP1	Keypad Interface
JP2	Emulation port
JP4	Local Microphone Jack Pins: Shield, circuit ground Ring, PTT active low Tip, Audio 10-150 mV_{pp}
JP6	Powered Balanced Line Interface Pins: 1 and 2 balanced line 3 Earth ground

Table 25 Jumpers and Controls for the UVLOC-B

JP3	Fault Sounder enable
JP5	Local mic unplugged sense enable
R28	Local mic level

Table 26 Indicators for the UVLOC-B

D7	Green Power Indicator LED. On when power is applied.
D8	Red Armed Indicator LED. On steady when Armed, Blinks when mic keyed or keypad button is processed by the UVLOC-B.
D9	Yellow Fault Indicator LED. Blinks once per second when mic is unplugged, twice per second when there is a system fault.
SO1/ Sounder	Fault Condition. Beeps once per second when mic is unplugged, twice per second when there is a system fault. Beeps once when key has been pressed long enough to be accepted by controller.

Connections for the UVLOC-B-EXP

The following tables provide the connectors and jumpers for the UVLOC-B-EXP.

Table 27 Connectors for the UVLOC-B-EXP

JP1	LOC Expansion Port Out – To JP31 on UVIC-B backplane
JP2	LOC Expansion Port In – From Next LOC Expansion board
JP4	LOC # 1 Line Pins: 1 (+), 2 (-)
JP6	LOC # 2 Line Pins: 1 (+), 2 (-)
JP8	LOC # 3 Line Pins: 1 (+), 2 (-)
JP10	LOC # 4 Line Pins: 1 (+), 2 (-)
JP12	LOC # 5 Line Pins: 1 (+), 2 (-)
JP14	LOC # 6 Line Pins: 1 (+), 2 (-)
JP16	LOC # 7 Line Pins: 1 (+), 2 (-)
JP18	LOC # 8 Line Pins: 1 (+), 2 (-)

Table 28 Configuration Jumpers for the UVLOC-B-EXP

JP3	LOC Port # 1 enable
JP5	LOC Port # 2 enable
JP7	LOC Port # 3 enable
JP9	LOC Port # 4 enable
JP11	LOC Port # 5 enable
JP13	LOC Port # 6 enable
JP15	LOC Port # 7 enable
JP17	LOC Port # 8 enable

Connections for the UVADM

The following table provides the connectors and jumpers for the UVADM.

Table 29 Connectors and Jumpers for the UVADM

JP1	Zone # 8 Line Fault enable
JP2	Zone # 7 Line Fault enable
JP3	Zone # 6 Line Fault enable
JP4	Zone # 5 Line Fault enable
JP5	Zone # 4 Line Fault enable
JP6	Zone # 3 Line Fault enable
JP7	Zone # 2 Line Fault enable
JP8	Zone # 1 Line Fault enable

Optional UVADM Connections

The UltraVoice Audio Distribution Module (UVADM) allows up to eight zone outputs. For each zone, you can set the output switch to either 25 or 70 V_{RMS} and set the amplifier selection switch to either Amplifier 1 or Amplifier 2. Do not exceed 400 W for either of the amplifiers. Each output can be switch-selectable monitored for line integrity, through the use of a 2.7 kilohms end-of-line resistor, and for ground faults. Line monitoring requires that each speaker is capacitively isolated and a 2.7 kilohms end-of-line resistor is required across the farthest speaker.

Figure 9 UVADM Diagram

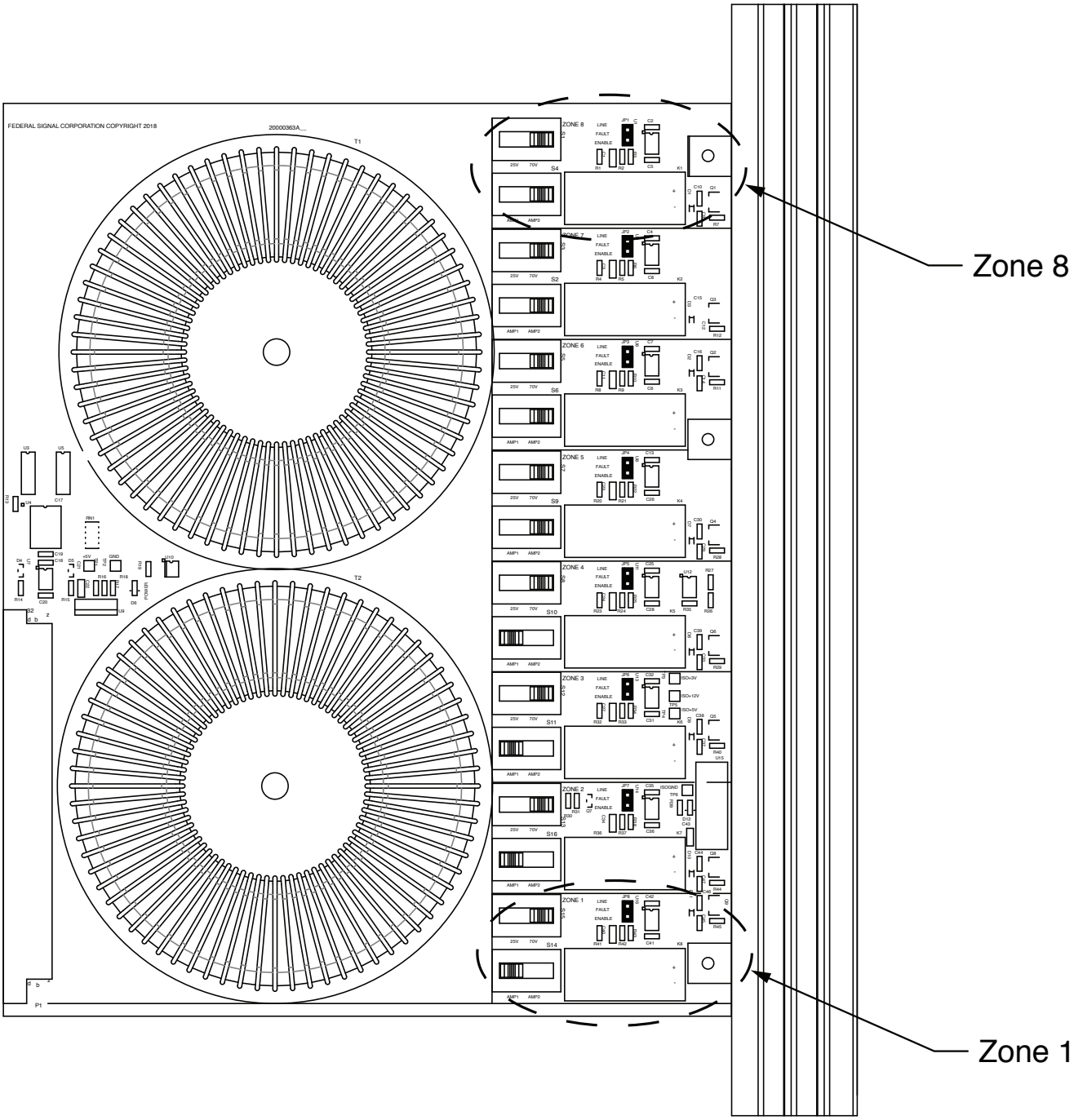
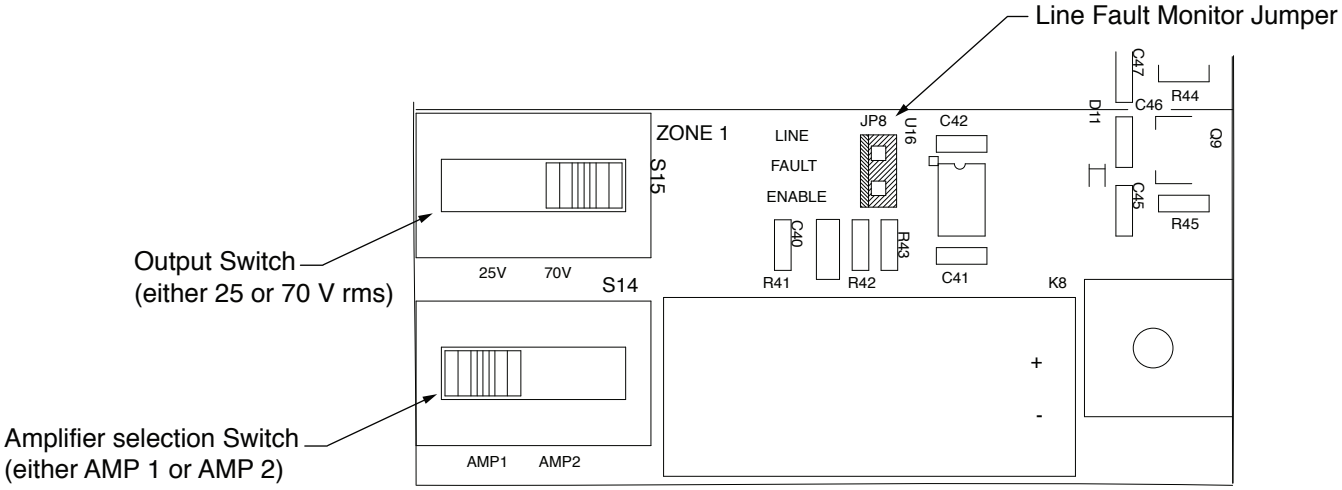


Figure 10 UVADM Selections for Zone 1



Turning on the Power

To turn on the power to the UVIC-B:

1. Verify all wiring is completed in the previous sections and that the connections are tight and secure. After the battery connections and antenna connections are made and the battery disconnect connector is plugged in, the UVIC-B is running on battery power.
2. The UV+ Controller CPU's LED begins to blink approximately 3 seconds after power is applied. See "Figure 12 UV+ Controller and UV400 Amplifier Front Panel Indicators" on page 50.
3. Connect AC power and verify that the battery charger LEDs turn on, indicating the charger is charging the batteries.
4. Turn on the radio transceiver power (if applicable) and verify the radio power LED turns on.

Installing User-Supplied Radio Receivers

⚠ CAUTION

Improper installation of radio control equipment may cause the speakers to malfunction or operate intermittently. Installation must only be performed by experienced radio technicians who have thoroughly read this manual.

POWER—Determine the radio power requirements. The UV+ Controller provides +12 Vdc on the RADIO connector on the front panel.

Table 30 Radio Connector, 8 pin MOD jack

1	Receive Audio, 300 mV – 10 V_{p-p}
2	Transmit Audio, 50 mV – 3 V_{p-p}
3	Carrier Detect - active low
4	PTT
5	+12 Vdc
6	GND
7	+12 Vdc
8	GND

Do not use this voltage source for radios, which draw more than 1.5 A of current in transmit. Use both grounds and both +12 Vdc connections for current handling. If a higher current output is required, purchase a 24 to 12 Vdc voltage converter. This converter is provided with the UVIC-B series models. Do not use one of the 12 Vdc batteries to run the radio equipment.

1. AUDIO—Connect the UV+ Controller Receive Audio Input to the de-emphasized Audio Output of the radio. Use shielded audio grade cable and keep wire runs as short as possible. The Receive Audio level can vary from 300 mV to 3 V_{p-p} unclipped.
2. Connect the Transmit Audio Output to the flat (not microphone) input of the radio. The Transmit Audio Output is adjustable from 100 mV to 3 V_{p-p}.
3. C.D.—The carrier detect signal from the radio must pull to ground when active. The radio carrier detect signal is useful for controlling live PA announcements. When the C.D. signal is removed from the controller for over 5 seconds, the controller automatically cancels the PA function which eliminates the need to broadcast the cancel tones over the speakers.
4. PTT—The PTT output pulls to ground when active to key the radio.
5. RX and TX Audio—Adjust the RX and TX Audio levels. See Pre-operational System Configuration and Testing.

Pre-operational System Configuration and Testing

⚠ WARNING

The following procedures should be performed by a properly trained technician to ensure the equipment is operating properly.

Visual Inspection

To conduct a visual inspection:

1. Fill out the ICM-UV Checklist to document the following inspections and tests. See Appendix A. Keep the completed document on file for future reference.
2. Verify all connections and fasteners are tight.
3. Ensure that all installation debris is removed from the cabinet.
4. Secure all wiring with wire ties to provide strain relief and to neatly manage the wiring.
5. Verify the control board clock LED is blinking.
6. Verify the charger LED(s) are on for the appropriate charging state. See Operations for charger details.

Amplifier and Speaker Pre-Operation Checkout

To conduct an amplifier and speaker pre-operation checkout:

1. See the wiring diagrams in Appendix B. Measure the DC voltage across the two batteries, battery 1 (+ terminal) and battery 2 (- terminal). The voltage should be at least 25 Vdc. If the voltage is below 25 Vdc, verify the green charging LEDs on the charger are lit. Allow the batteries time to charge before continuing with the tests.
2. Verify the microphone is plugged into the 1/4-inch jack in the control module. Turn the microphone volume potentiometer fully counter clockwise. Press the PTT button on the microphone and announce a test message (for example, “Testing 1,2,3,4, Testing”). Turn the microphone volume knob clockwise until the desired level is obtained during the test count.
3. Verify the Audio A, Audio B, ARM, and PA LEDs on the UV+ Controller and the green LEDs on each amplifier light when the test message is broadcast.
4. Calibrate the Quiet Test function by pressing switches 2 and 3 on the UV+ Controller at the same time.
5. Test all siren signals at this time by momentarily pressing the appropriate switch on the UV+ Controller.

Adjusting the Radio Transceiver

This procedure is previously completed at factory. Only readjust if radio re-alignment is required or if the radio is being installed in the field.

Qualifications

Requires a properly trained Radio Technician.

Equipment Required

- Radio Service Monitor
- Oscilloscope
- Reflected power meter

Setup

Connect the radio to the service monitor.

Adjusting the receive audio

To adjust the receive audio:

1. Using a service monitor, modulate the correct RF signal into the receiver with a 1 kHz tone:
   - If bandwidth is 12.5 kHz (typical), then modulate at 1.5 kHz deviation. If using private line, add 0.375 kHz private line deviation to the signal.
   - If bandwidth is 25 kHz, then modulate at 3 kHz deviation. If using private line, add 0.75 kHz private line deviation to the signal.
2. Adjust the level at the RX Test pin for 1 V_{p-p} using the RX GAIN trimpot. See “Figure 12 UV+ Controller and UV400 Amplifier Front Panel Indicators” on page 50.

Adjusting the transmit deviation

To adjust the transmit deviation:

1. Simultaneously press buttons 5 and 7 on the UV+ Controller. This causes the controller to transmit for approximately 8 seconds.
2. Measure the deviation level using a radio service monitor set to the correct RF.
3. Adjust the TX GAIN (UV+ Controller) for the following deviation level on the radio service monitor.
   a. If bandwidth is 12.5 kHz (typical), then adjust for 1.5 kHz deviation. If using private line, add 0.375 kHz private line deviation to the signal.
   b. If bandwidth is 25 kHz, then adjust for 3 kHz deviation. If using private line, add 0.75 kHz private line deviation to the signal.
4. If this step fails to solve issue, then check base station deviation levels as per base station documentation and manual. Also if used, check the repeater.

   NOTE: Obtain slightly higher S/N levels by increasing the RF modulation levels to 4 and 2 kHz depending on the channel spacing. Do not exceed these deviation levels. Set all sites in the system to the same modulation level.

600-ohm Level Adjustment Procedure for Communications

Not available if UVLOC-B is being used. If used, remove shorting jumpers from JP6 on the UVIC-B backplane. See. “Figure 5 Connections for the UVIC-B Backplane” on page 36.

To use the 600-ohm input for receive audio, place a jumper across pins 2-3 of JP6. JP6 is located internally on the UV+ Controller.

To use the 600-ohm input for transmit audio, place a jumper across pins 2-3 of JP7. JP7 is located internally on the UV+ Controller.

1. RX Adjustment

a. Ensure Base Station TX level is adjusted properly. Nominal base station TX level would be 1 Vp-p or approximately 0 dB.

b. Transmit a tone from the Base Station.

c. Ensure tone is not clipped by viewing waveform with an oscilloscope.

d. Adjust the level at the RX Test pin for 1 $V_{p\text{-}p}$ using the RX GAIN trimpot.

e. Ensure tone is not clipped by viewing waveform with an oscilloscope.

2. TX adjustment

a. Simultaneously press switches 5 and 7 on the UV+ Controller. This causes the controller to transmit for approximately 8 seconds. See “Figure 16 UV+ Controller Switches” on page 58.

b. Determine proper siren TX level required (typically 1 $V_{p\text{-}p}$ or approximately 0 dB.)

c. The TX levels for all of the siren controllers must be the same.

d. Verify the RX audio received at the Base Station is not clipped or distorted by viewing waveform with an oscilloscope.

600-ohm Level Adjustment Procedure for External Audio Source Input

To use the 600-ohm input for external audio, place a jumper across pins 1-2 at JP6. JP6 is located internally on the UV+ Controller.

1. Audio source adjustment for external audio source.

a. Transmit a tone from the external audio source.

b. Ensure tone is not clipped or distorted by viewing waveform with an oscilloscope.

c. The nominal external audio source level is 1 Vp-p.

d. Adjust the external audio source to the appropriate level.

2. Audio source adjustment for UVIC-B controller.

a. Transmit a tone from the external audio source. Note that a contact closure at JP15 pins 10 and 11 (PTT: Push To Talk) is required to activate audio mode.

b. Adjust the level using the external audio gain adjustment R123 (R123 is located internally on the UV+ Controller).

c. Set for same level as the standard siren sounds.

d. Ensure that the sound is not distorted.

Control and Status Monitoring

To test the control and status monitoring features:

1. Use the Commander Software System to verify the UVIC-B has been properly configured for the application. Make any required changes.
2. Test the control and status monitoring features from each control point. Test each control function and all status indications using Commander. Verify each status point provides the proper indication of both pass and fail conditions.

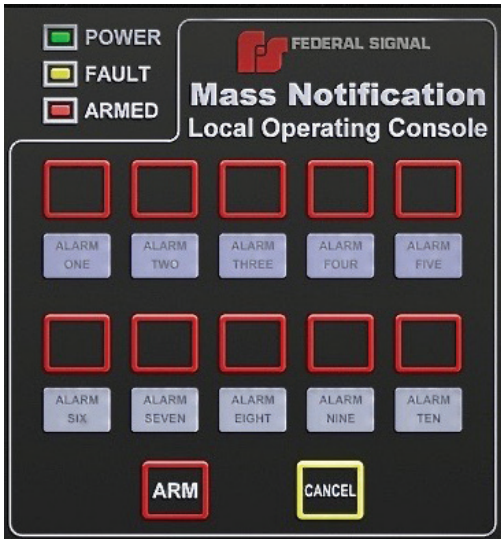
Testing the Optional UVLOC-B

If using the UVLOC-B, add shorting jumpers on JP6 on the UVIC-B backplane and across pins 1 and 2 of JP6 on the UV+ Controller.

To test the UVLOC-B:

1. After all connections have been made and power is applied to the UVIC-B, verify the green power LED on the UVLOC-B is on.
2. Press the ARM button and verify the red armed LED turns on.
3. Use the microphone and press the PTT button while speaking into the microphone. Verify the PA audio is clear and at the desired output level.
4. Use a small straight blade screwdriver to adjust the microphone sensitivity.
5. To adjust the speaker level at the UV+ Controller:
   - Unplug the speakers and turn the local Mic level pot on the UV+ Controller all the way down.
   - Inject a sinewave at 590 mVrms (1.66 V_{pp}) into JP12 on the UVIC-B backplane, the 600-ohm port, (pin 1 is GND and pin 2 is audio) and key the local mic.
   - Alternately, press ARM from the UVLOC-B, and then press and hold the ARM and the CANCEL buttons simultaneously.
   - Adjust R123 (the 600-ohm PA level) until there is 3 to 3.5 V_{rms} (9 to 10 V_{pp}) at TP5 or TP6 on the UV+ Controller.
6. After the levels have been properly adjusted, verify all other functions operate properly from the UVLOC-B control panel.
7. Label the UVLOC-B to ensure the operators know what messages and functions are available. Verify the UVLOC-B is labeled properly for the application.

Figure 11 UVLOC-B Front Panel



Operations

The UVIC-B is housed in a cabinet that contains a card cage with four plug-in cards consisting of the following:

- One controller slot (UV+ Controller)
- Two amplifier slots (UV400 Amplifiers)
- One slot for optional UltraVoice Audio Distribution Module (UVADM)

UV+ Controller and UV400 Amplifier Front Panel Indicators

The following table provides the descriptions of the UV+ Controller front panel indicators. See Figure 12.

Table 31 Front Panel of UV+ Controller

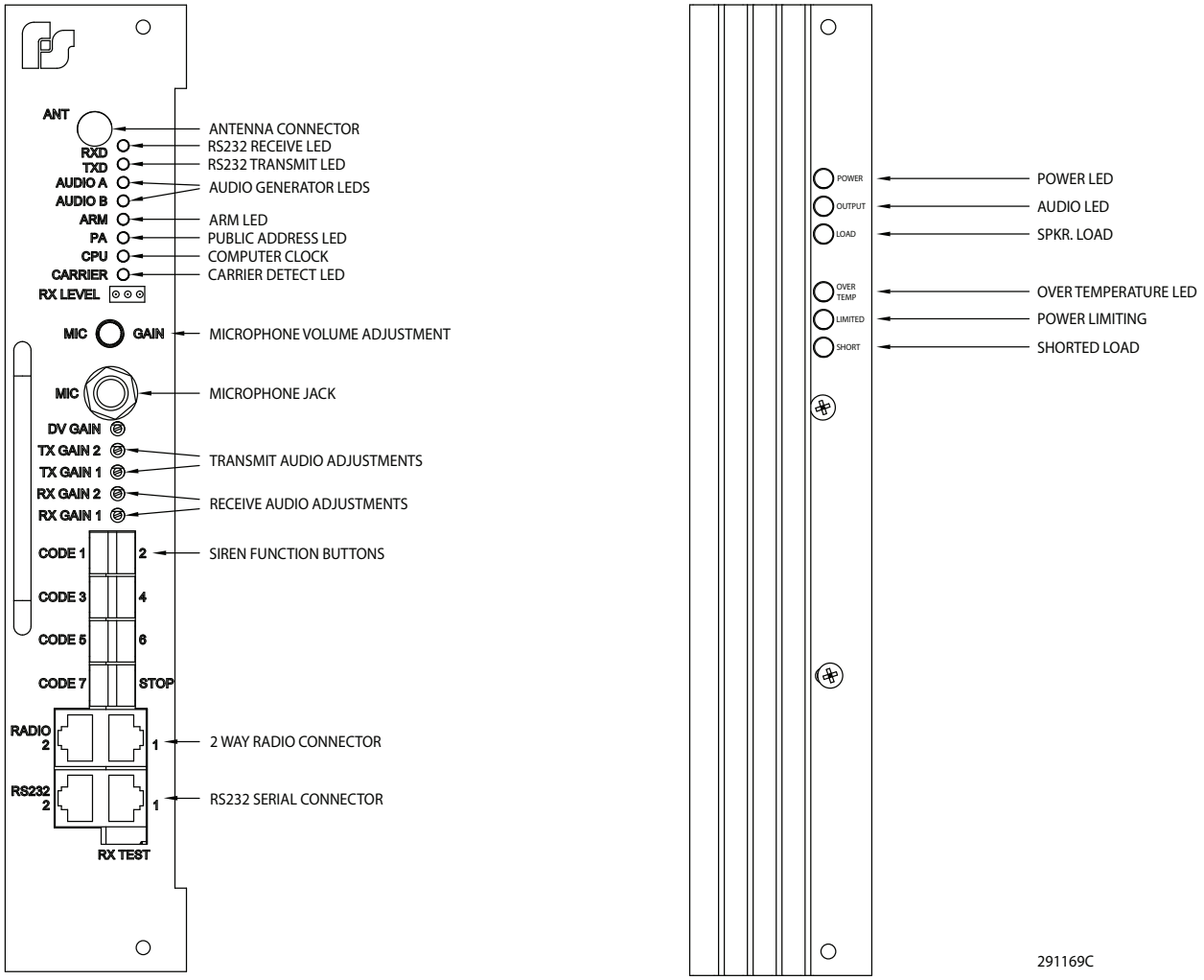
Label	Activate with a hold time > 0.50 seconds
ANT	Antenna connector when used with a one-way radio receiver
RXD	Receive serial data and receipt of radio channel modulation
TXD	Transmit serial data and DTMF and digital
AUDIO A	Audio present on channel A
AUDIO B	Audio present on channel B
ARM	Unit Armed Indicator
PA	Public Address mode indicator
CPU	Microprocessor heartbeat
CARRIER	Radio frequency (RF) carrier indicator ON with carrier present
RX LEVEL	3 stage LED bar graph
MIC GAIN	Local PA level range sufficient to drive amplifiers into clipping with 50 mV nominal input level. Microphone volume adjustment knob.
DV GAIN	Volume adjustment for digital voice option. Internal Digital Voice level sufficient to drive TP5 or TP6 into clipping.
TX GAINs	Transmitted audio adjustable from 50 mV to 1 V_{P-P}
RX GAINs	Received Audio level 300 mV to 3.00 V_{P-P}

The following table provides the description of the UV400 amplifier front panel indicators. See Figure 12.

Table 32 Front Panel Indicators for Model UV400 Amplifier

Label	**Description**
POWER	Power LED is only on during activation
OUTPUT	Audio LED is on when amplifier is transmitting
LOAD	Speaker Load is on during activation with speaker load
OVER TEMP	Over Temperature LED is on when amplifier reaches an over-temperature condition. Call Technical Support if light remains on.
LIMITED	Power Limiting is on or flashing during activation when overdriving amplifier.
SHORT	Shorted Load is on when load appears shorted.

Figure 12 UV+ Controller and UV400 Amplifier Front Panel Indicators



Basic UVIC-B Controller Programming

The following information is the minimum required configuration of the UVIC-B Controller. Commander is required.

Unit Type

The Unit Type is set to the type of siren this unit is controlling, and is usually determined by the number of cells in the speaker array. When setting up the unit type, the user selects from a menu with the following choices.

Table 33 Unit Type Selection Table

Unit type	Quantity	Siren Type	Total Power
UV - 1	One (1) UV400	MOD1004B	400 W
UV - 2	Two (2) UV400	MOD2008B	800 W

Radio Communications

For units equipped with the integral radio receiver, the RF frequency configuration parameter sets the frequency of the radio channel. Changing this parameter from its factory setting may require re-alignment of the radio for maximum performance. The value entered must fall within the range specified for the receiver band equipped.

Activation Formats

For Two-Tone activated units, the Two-Tone Timing parameters configures the time duration of the activation tone codes. The three parameters, A-Time, B-Time, and S-Time; sets the time duration for the A-Tone, B-Tone, and Single-Tone respectively.

NOTE: The Two-Tone timing parameters are minimum values only. The actual tone times may be longer than the specified times.

EAS Location Codes

Up to three location codes may be assigned for EAS activation. For activation to occur, the location code of the received EAS message must match one of the three assigned codes.

You cannot program units for both Tone and EAS activation at the same time. Therefore, when using EAS decoding, set the A-Time, B-Time, and S-Time parameters to zero. The UVIC-B is capable of being programmed for EAS, DTMF and Federal Digital decoding at the same time. Refer to www.fcc.gov for further information about EAS messages.

128/256-bit Encryption Key

The 128/256-bit data encryption provides security against malicious operation or monitoring. The security key is programmed during the flashing of the microprocessor and must match the encoder (SS2000+ or Commander) being used to activate the unit. A key value of zero disables encryption and must be used if the encoder does not support encryption. All sites in the system must use the same encryption key.

Security Key

The Security Key is a unique number assigned to the system that prevents nearby systems operating on the same RF frequency from interfering. Like the encryption key, the Security Key is programmed during the flashing of the microprocessor and must match the encoder. The exception is a key value of 65535 (the default), defined as an open system and communicates with all encoders regardless of the encoder's key setting.

User Programs

The UVIC-B controller has the capacity to store up to fifty user programs. Each user program contains twenty stacked function items.

Assigning more than one function to each activation code or user program allows you to run a sequence of functions without sending additional activation commands. A complete list of activation functions is found in the Commander Software Reference Manual.

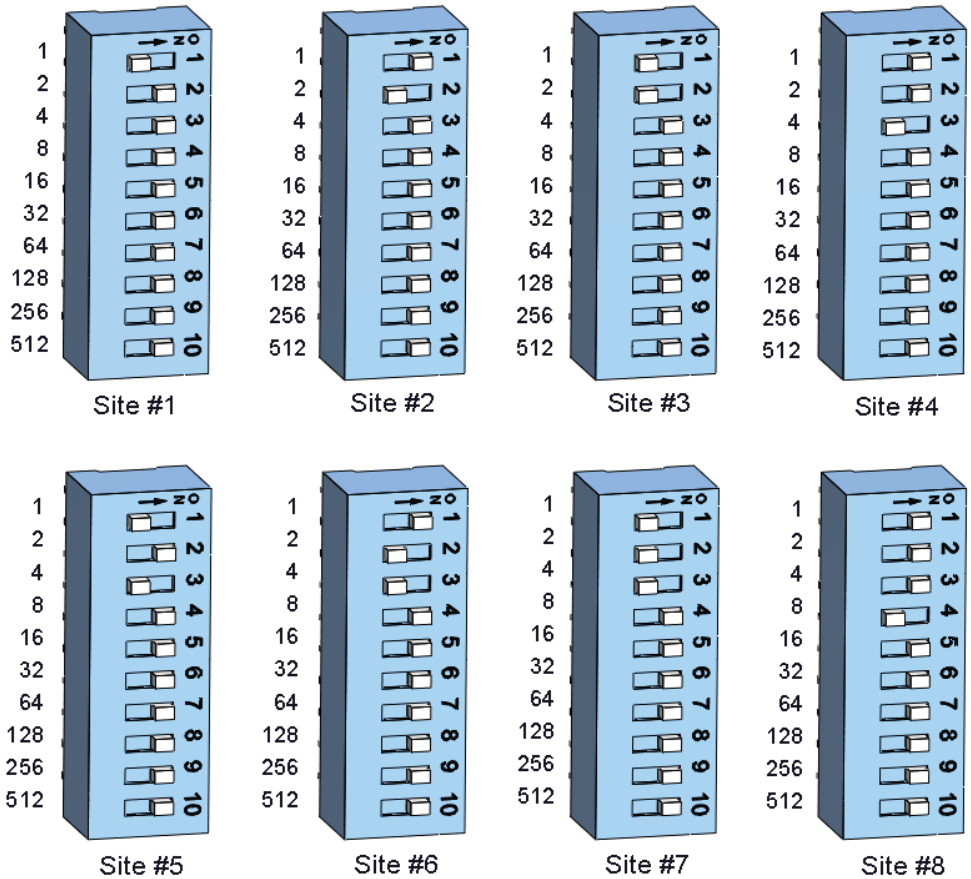
Site Address Switch (S1)

For digital systems only: In order for the siren to report back with its identity, define the site address by setting dip switches located on the board. The dip switches have values of 1, 2, 4, 8, 16, 32, 64, 128 256, 512. Add appropriate dip switch values to define the site number address.

Example

To define the board for Site #1 toggle first dip switch to the left. All other dip switches are to the right. For Site #2 toggle the second dip switch to the left. For Site #3 toggle the first and second dip switch to the left. For Site #4 toggle the third dip switch to the left. For Site #5 toggle the first and third dip switch to the left. Continue this method to define other site number addresses.

Figure 13 Setting the Switch Number Example



Switch number	1	2	3	4	5	6	7	8	9	10
Binary number	1	2	4	8	16	32	64	128	256	512

Example: Switch numbers 1, 2, and 3 are binary numbers 1, 2, and 4.

Add 1 + 2 + 4 = 7; 7 is the unit address

NOTE: Programming details are in the software manual. The site address is stored at power up of the controller. If the site address is changed, the power (battery and AC) must be turned off and then on.

Connections for the UV+ Controller

The following table provides settings and interface inputs and outputs for the UV+ Controller.

Table 34 UV+ Controller Setting I/O

J1	Pins 9 and 10, P1#1 Baud Rate Selection Jumper ON=9600 Baud, OFF=1200 Baud
J2	Front Panel Microphone jack 10 kΩ input impedance, 50 mV_{P-P} nominal input level.
JP1	microSD holder on PCB
JP2	Special option jumper that requires special firmware
JP3	Connector pins for one-way radio receiver
JP4	Options Connector for SINAD
JP6	600-ohm (JP12) Input Configuration Jumper Pins: • Remove all jumpers if using JP12 as an output • Use shorting plug between pins 1 and 2: Audio from 600 ohm (UVLOC-B or JP12) to go to amplifiers when PTT (UVLOC-B or JP15) is closed • Use shorting plug between pins 2 and 3: Audio from 600 ohm (JP12) audio in to receiver decoders
JP7	600-ohm (JP12) Output Configuration Jumper Pins: • Remove all jumpers if using JP12 as an input • Use shorting plug between pins 1 and 2: System will output siren audio to JP12 • Use shorting plug between pins 2 and 3: Used when controlling the system and JP12 is being used in two-way operation
JP8	CTCSS Connector Pins
JP9	Transceiver #1 VOX selection Use shorting plug for VOX Carrier Detect
JP10	Dual receiver priority jumper Jumper EXT side to give external receiver first priority Jumper INT/EXT2 side to give on-board receiver or external receiver second priority Jumper neither side, first carrier detect has priority
JP11	Jumpered when SINAD option is used
JP12	Short to force Carrier Detect of External transceiver 1
JP13	Front Panel External Transceiver (radio) Connector Ports #1 and #2
JP14	Equalizer setting for public address or digital voice. Setting is normal or treble.
P1	Front Panel RS232 Ports #1 and #2 • Use P1 #1 to control and monitor data at 1200 or 9600 baud. Baud rate is selected by J1, 9-10. ON=9600 Baud, OFF=1200 Baud • Use P1 #2 with the 9600 baud scrolling message display option.
R123	600 ohm audio transformer Public Address level adjustment.
R125	600 ohm audio transformer TX level adjustment.

Connections for the IP Network PCB

The following tables provide the connectors and indicators for the IP network PCB.

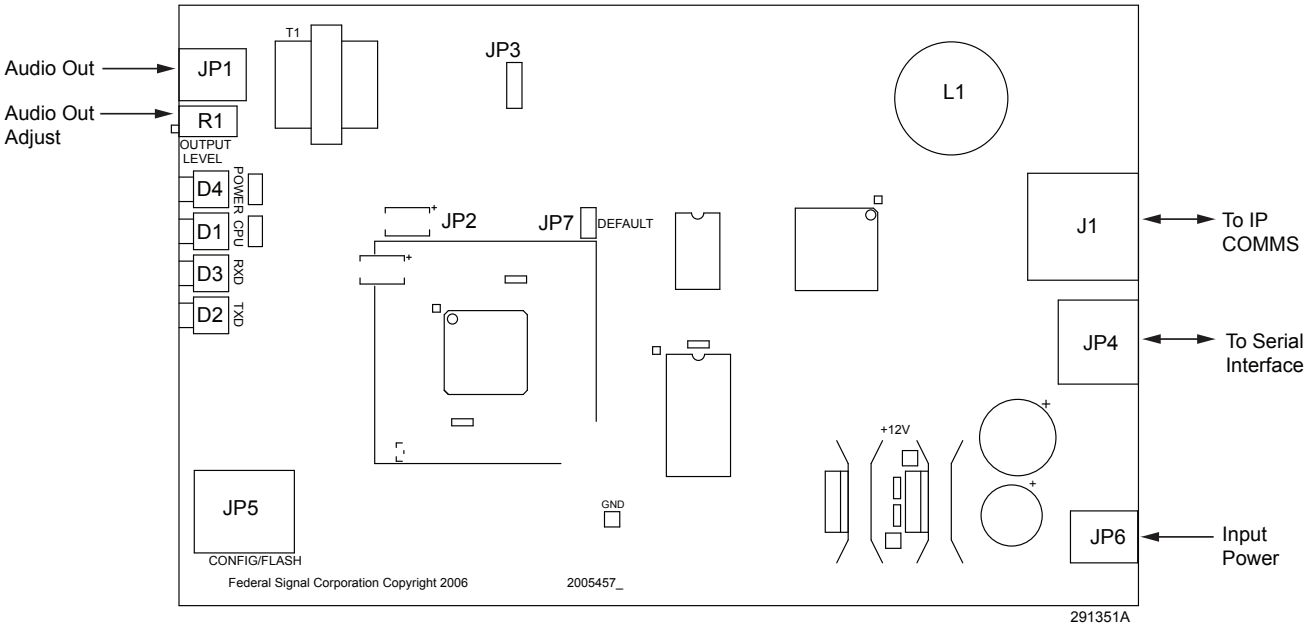
Table 35 Connectors for the Serial to Network PCB

JP1	600 Ohm Audio Output Port Balanced line output (To JP12 UVIC-B backplane)
JP6	10.5-95 Vdc Power Input: 1- (-), 2- (+)
JP7	Resets board back to factory default settings.
J1	Network Port

Table 36 Indicators for the UVIC-IP

D1	CPU Heartbeat indicator, green
D2	Transmit data indicator, red
D3	Receive data indicator, yellow
D4	Power indicator, green

Figure 14 Serial to Network Board



Status Alarms

The UVIC-B provides status alarms using a variety of sensors, which when equipped with a two-way radio or other two-way communications allows the unit to communicate its status back to the base station. This reduces station down time by quickly alerting operating personnel to potential problems at remote sites.

The following status is provided:

- AC Power
- Battery Voltage
- Charger Operation
- Activation Current

- Signal A and B
- Quiet Test
- Intrusion
- Ground and line faults

Battery Charger Status

Charger Status is indicated by the LEDs on the front of the charger.

Figure 15 LEDs on charger

Table 37 LEDs description

LED	Description
CURRENT	Green LED indicates charge current is being delivered to the battery. LED intensity increases with charge current.
TRICKLE	Yellow LED indicates battery voltage is below 20 V and the charger is trickle charging at a low current level.
BULK	Yellow LED indicates battery voltage has dropped below 90% of the float voltage setting and charger is charging at a high current level.
READY	Green LED indicates battery has reached the float voltage. The charger is float charging at the float voltage setting.
FAULT	Red LED indicates a charger fault. Charger may be delivering abnormally low current or has a blown fuse or is not producing the correct output voltage.

NOTE: Battery Voltage is temperature compensated when the temperature is above 86°F (30°C).

Local Quiet Test

The Local Quiet test allows performing Quiet Tests on the siren control and siren speaker array. Quiet Test uses a 20 kHz tone to quietly test the tone generators, amplifiers, and speaker drivers. To perform this test, program the Quiet Test under one of the activation codes. If it is one of the first seven codes, activate it manually through the switches on the front panel or with the remote activation inputs. Normally once the Quiet Test is programmed under one of the activation codes, the code is activated over the radio channel, the panel switches or with a local laptop computer running the Commander Software System.

Operation

Obtain the results of a Quiet Test remotely using the SS2000+ printout or Commander. Obtain the status locally at the siren site with a portable computer running Commander. The actual amplifier voltage and current are monitored with Quiet Test providing a true indication of each amplifier and load performance.

Finding Faults

When using Commander, the controller automatically updates the Quiet Test status each time a new Quiet Test is run. Obtain the status from the status detail screen and from the Reports menu.

Digital Voice Recording

When purchased, the Digital Voice option adds a microSD card that is capable of storing up to 4,093 voice or tone messages that total up to 17 hours of total recording time.

File Format

The digital voice message format is 8000 samples per second, 8 bit, mono. Save these messages with a DV#.wav naming format or the messages are not recognized. This naming format results in messages DV1.wav through DV4093.wav.

Voice Levels Within Files

Voice sections of a recording should be “Normalized” so that the peaks are at the limits. After Normalization, increase the gain by 6 dB (200%) to deliver full nominal output power at the peeks and about 3.5 dB down on average during a word.

Tone Levels Within Files

Tone signals in the recording (such as, siren sounds, horn sounds, and music) should be at no more than 36% of the maximum level (-9 dB) to prevent them from overdriving the amplifiers and overpowering the drivers. These can be normalized to set them at the maximum level and then reduced to 36% or -9 dB.

These levels assume that the attenuation is programmed for 0 dB and that the DV GAIN on the UV+ Controller is turned fully up. See “Figure 12 UV+ Controller and UV400 Amplifier Front Panel Indicators” on page 50. This delivers -1.8 dB compared to the square wave siren tones or about 54 V_{rms}. For UVRI-Bs, this delivers -2 dB compared to the square wave siren tones.

Filtering Files

You need to filter the files to reduce content below 300 Hz. This prevents low-frequency tones in a recording from saturating the output transformer and the speaker drivers.

NOTICE

SPEAKER DAMAGE: The speaker drivers can not reproduce these frequencies and can be damaged by them.

Checking/Setting UV+ Controller DV Levels

These levels assume that the attenuation is programmed for 0 dB and the DV GAIN on the UV+ Controller is turned fully up.

To check the UV+ Controller DV levels, with the speakers un-plugged from the amplifiers:

1. Turn the DV GAIN pot fully (25 turns) counter clockwise.
2. Play the stored tone function.
3. Monitor the amplifiers output level.
4. Turn up the DV GAIN pot until 69 V_{rms} is reached.

   NOTE: It is important to start by turning the DV GAIN pot down to a low level and work your way up to prevent overdriving the amplifiers.

Alternatively, with the speakers plugged into the amplifiers:

1. Turn the DV GAIN pot fully (25 turns) counter clockwise.
2. Play the stored tone function.
3. Monitor the amplifiers output level.
4. Turn up the DV GAIN pot until 54 V_{rms} is reached.

   NOTE: It is important to start by turning the DV GAIN pot down to a low level and work your way up to prevent overdriving the amplifiers and speakers.

These methods leaves the tone 0.4 to 1.8 dB low, depending on frequency, but limits the current to a safe level.

Converting the files

To convert the files, do the following:

1. Adjust the amplitude to ensure that the peaks are at or slightly into the limits. If converting from 16 bit to 8 bit, ensure that dithering is disabled.
2. To program activation codes with Digital Voice Messages under them, follow the instructions in the programming software. It is possible to assign codes to the functions DIG VOICE 1 through DIG VOICE 4093. As in all sounding functions, the unit must first receive the ARM command followed by one of the DIG VOICE commands to activate the stored message. The Digital Voice Volume is adjustable through a potentiometer located on the controller front panel, called DV GAIN.

Manual Activation

Use the manual activation switches to activate siren functions. Switches are located on the front panel of the UV+ Controller. In addition, activating switches simultaneously can operate specific testing and calibration features. See Table 38.

Figure 16 UV+ Controller Switches

Table 38 Manual Activation Switches on UV+ Controller

Function Switch	Function
CODE 1	Activates function 1
CODE 2	Activates function 2
CODE 3	Activates function 3
CODE 4	Activates function 4
CODE 5	Activates function 5
CODE 6	Activates function 6
CODE 7	Activates function 7
STOP	Reset
CODE 1 and CODE 6	Loads default speaker calibration values and transmits DTMF characters (production testing)
CODE 2 and CODE 3	Calibrate speaker load and Xmit DTMF Quiet Test
CODE 5 and CODE 7	Transmits 1200 Hz tone for radio deviation adjustment

NOTE: At any time during a sounding function, press the STOP switch to cause the unit to halt all output immediately.

Local Public Address

With the optional microphone (part number MNC-MC), the operator has the ability to locally give a Public Address (PA) message. You can enter the PA mode by plugging the MNC-MC into the microphone receptacle labeled MIC on the UV + controller's front panel. The PA LED is lit anytime the press-to-talk (PTT) button on the microphone is pressed.

NOTES:

- The microphone volume adjustment knob, labeled MIC GAIN, is located on controller card front panel.
- Local PA overrides ALL siren functions activated either remotely or locally.

UVLOC-B

Train all potential users on the use of the control panel. When the UVLOC-B is properly connected to the UVIC-B, the green power LED is lit.

Activating a Live PA

To activate a live Public Address (PA):

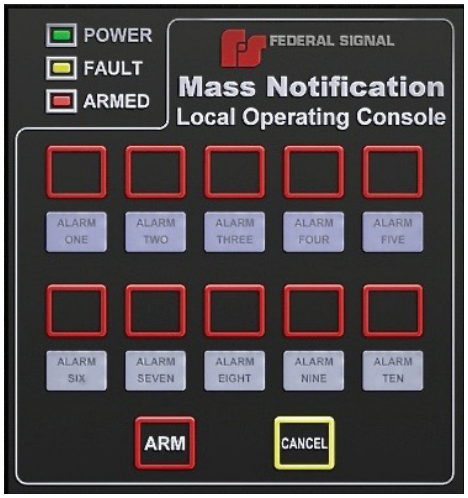
1. Press the ARM button for 1 second.

   The red armed LED lights to indicate it is ready to use and an alarm is automatically sent to the control system indicating use of the control panel. If no function is activated, the panel is automatically disarmed after 30 seconds. If a function is activated, the panel remains armed for the duration of the function or until disarmed. The panel is also armed when any other control point arms the UVIC-B.

2. Remove the microphone handset from the enclosure.
3. Hold down the push-to-talk (PTT) button while speaking into the microphone and release button to stop live PA.

   When the PTT button is released, the microphone is disconnected and the function stops until the ARM button is pressed again.

Figure 17 UVLOC-B Front Panel



Activating a Digital Voice Message

To activate a digital voice message:

1. Press the ARM button for 1 second.
2. Press one of the 10 buttons.

Maintenance

⚠ WARNING

ELECTRICAL HAZARD: Service and maintenance should be performed by qualified personnel familiar with the UVIC-B, associated controls, and power sources being used and in conjunction with the authorities having jurisdiction. Before servicing or maintaining, ensure that remote activation cannot occur and disconnect power to the UVIC-B.

SOUND HAZARD: The sound output of speakers is capable of causing permanent hearing damage. Use adequate hearing protection and avoid excessive exposure. To prevent the speakers from sounding, always turn off the power to the UVIC-B at the AC disconnect and remove any DC power being supplied before inspecting or maintaining the speakers.

Control Unit Preventive Maintenance

Test the UVIC-B for proper operation at least once a month. A daily test at noon, curfew, or other selected time is preferred. This not only enhances the usefulness of the UVIC-B and verifies that it remains ready for use when needed; it also instills confidence in the reliability of the system.

In order to minimize the potential for a failure, annual inspection and maintenance is recommended.

General Maintenance

Checking Signal Operational

To check signal operational:

1. When checking for proper control module output, unplug the connectors to the speakers (at the bottom of the UVIC-B backplane) to eliminate output from the speaker array.
2. Activate each of the signals and observe the signal indicators on the control module and the amplifiers.
3. If desired, connect an oscilloscope or digital multimeter (DMM) at the speaker connections to observe the amplifier output. This output should be at least 67 V_{RMS} during a signal if the amplifier is programmed to run at full power. To limit sound output, plug in one amplifier at a time during this test.
4. Restore all of the speaker connections to enable amplifier outputs.

Checking the Battery

To check the battery:

1. The voltage of a fully charged set of batteries should be approximately 27.0 Vdc, and charger current should be less than 2 amperes. The charger is set for 27.0 +/- 0.1 Vdc at room temperature.
2. Load test the batteries per the manufacturer's specifications.

3. Maintain or replace the battery as recommended by its manufacturer; obey local or state laws governing the disposal of lead-acid batteries.
4. Check the battery terminals for corrosion. Clean and grease connectors and terminals, if necessary.

Table 39 Troubleshooting

Problem	Action
No Radio Decode	• Unit is not programmed to recognize that particular code sequence or signal is not being received properly. • Verify programming is correct. Check the received audio signal quality at the RX test pin on the front of the control card.
Low output from speaker array	Check battery voltage. Also check signal indicators on amplifiers during a function. If indicators are off, remove amplifier for service.
Function stops before normal timeout	Batteries may require further charging. Check battery voltage under load. Check charger output.
Local PA feedback	Lower PA volume using knob above MIC connector.
Local PA has little or no output	Hold MIC close to mouth. Increase PA volume using knob above MIC connector.
Batteries not holding charge	Check that charger fuses are intact and check charger output. Load test batteries.
Relay output on UVIC-B backplane does not operate	Check that the relay on the UVIC-B backplane is operating (indicated by LED D2). Also check fuse F1 on the UVIC-B backplane (10 A).
Radio PA takes too long to timeout	Check radio for proper operation of squelch. CD LED should light while carrier is present
Landline activation inputs do not function	Verify minimum 1 second contact closure is applied to JP14 on the UVIC-B backplane.

Replacement Parts

To order replacement parts, see Getting Service.

Table 40 Replacements Parts

Description	Part Number
Battery, Sealed, AGM, 12 Vdc	Q155197A
120 Vac Battery Charger	Q860000236-03
240 Vac Battery Charger	Q860000236-04
F1, F2 - FUSE, 10 A, 32 V, AUTOFUSE	148A142A-05
F3 - 60 A BARFUSE	14801739A
F4 - Fuse, 2 A, 32 V, AUTOFUSE	148A142A-10

Getting Service

If you are experiencing any difficulties, contact Federal Signal Customer Support at 800-548-7229 or 708-534-3400 extension 7511 or Technical Support at 800-524-3021 or 708-534-3400 extension 7329 or through e-mail at techsupport@fedsig.com. For instruction manuals and information on related products, visit http://www.fedsig.com/

Appendix A ICM-UV Checklist

Type of service performed: ☐ Install ☐ Commissioning ☐ Maintenance

Project Information		
1. Customer Name:	2. FS Order #:	
3. Installation Company:	4. Tech:	5. Contact #:

Siren Information (complete this section for install, commissioning & maintenance)			
6. Siren Controller Type:	7. Site #	8. Siren Head Type:	
9. S/N:	10. Board Model #:		
11. GPS Lat:	12. GPS Long:	13. Address:	
14. AC Voltage: VAC	15. Charger 1*: VDC *Note: Verify UV-Instruction Sheet for proper Charger measurement.	16. Charger 2*: VDC *Note: Verify UV-Instruction Sheet for proper Charger measurement.	17. Radio: VDC
18. Firmware:	19. Encryption: ☐ 128 ☐ 256		
20. Time Encryption: ☐ Yes ☐ No If blank and/or "NO" please explain		21. UTC Time Encryption: ☐ Yes ☐ No If blank and/or "NO" please explain	22. Security Key:
23. Intrusion switches operational: ☐ Yes ☐ No ☐ N/A		24. Padlock: ☐ Yes ☐ No Keyholder Number: Keyholder Name:	

Radio Information (complete this section for install, commissioning & maintenance) ☐ **N/A**			
25. Radio Make:		26. Radio Model:	
27. Comm. Mode: ☐ Analog ☐ P25 ☐ Digital Type:			
28. Trunking: ☐ Yes ☐ No		29. BW: ☐ 25 ☐ 12.5 ☐ 6.25	
30. CH1 RTU Tx RF:	31. CH1 RTU Tx Dev:	32. CH1 RTU Tx-PL:	33. CH1 RTU Tx-PL Dev:
34. CH1 RTU Rx RF:	35. CH1 RTU Rx Dev:	36. CH1 RTU Rx-PL:	37. CH1 RTU Rx-PL Dev:
38. CH2 RTU Tx RF:	39. CH2 RTU Tx Dev:	40. CH2 RTU Tx-PL:	41. CH2 RTU Tx-PL Dev:
42. CH2 RTU Rx RF:	43. CH2 RTU Rx Dev:	44. CH2 RTU Rx-PL:	45. CH2 RTU Rx-PL Dev:
46. Antenna secure: ☐ Yes ☐ No	47. Antenna Model:	48. Antenna Height:	49. VSWR: ☐ N/A

Network Information (complete this section for install, commissioning & maintenance) ☐ **N/A**	
50. IP Address:	51. Subnet Mask:
52. SmartMessage Server IP:	53. MAC Address:
54. Gateway:	55. RTU Address:

Batteries (complete this section for install, commissioning & maintenance)			
56. Battery Manufacturer:		57. Battery Model:	
58. Battery Age: New ☐ Unknown ☐		59. Battery Corrosion Protection Applied: ☐ Yes ☐ No	
60. Battery 1: VDC	61. Battery 2: VDC	62. Battery 3: VDC	63. Battery 4: VDC
64. Total Battery: VDC			

2645 Federal Signal Drive, University Park, Illinois, 60484 | Technical Support (800) 524-3021 | Customer Support (800) 548-7229

Speaker Impedance > 4.0 ohms If more than 8 amps, use identical 2nd form		**Amplifier RMS VAC Speakers Disconnected**	**Amplifier RMS VAC Speakers Connected**
65. Amp 1: ohms	• Typically, 4.7 ohms for a MOD • Typically, 9.4 ohms for a DSA-2 • Reference applicable wiring diagrams for siren head	73. Amp 1: VAC	81. Amp 1: VAC
66. Amp 2: ohms		74. Amp 2: VAC	82. Amp 2: VAC
67. Amp 3: ohms		75. Amp 3: VAC	83. Amp 3: VAC
68. Amp 4: ohms		76. Amp 4: VAC	84. Amp 4: VAC
69. Amp 5: ohms		77. Amp 5: VAC	85. Amp 5: VAC
70. Amp 6: ohms		78. Amp 6: VAC	86. Amp 6: VAC
71. Amp 7: ohms		79. Amp 7: VAC	87. Amp 7: VAC
72. Amp 8: ohms		80. Amp 8: VAC	88. Amp 8: VAC

Extended Audio/Visual Inspection (complete this section for install, commissioning & maintenance)	
89. Siren programmed: ☐ Yes ☐ No	90. Calibrated Amplifiers: ☐ Yes ☐ No
91. Audibly Sounded Siren: ☐ Yes ☐ No If "NO" please explain	92. DV messages tested: ☐ Yes ☐ No
93. Cleaned Cabinets: ☐ Yes ☐ No	94. Desiccant in Control Cabinet: ☐ Yes ☐ No
95. Antenna installed per manual: ☐ Yes ☐ No	96. Antenna Connectors Sealed: ☐ Yes ☐ No
97. Pole installed per manual: ☐ Yes ☐ No	98. Backfill of Hole/Site cleaned up: ☐ Yes ☐ No
99. Cabinet installed per manual: ☐ Yes ☐ No	100. Height of Control Cabinet from ground:
101. Lighting Arrester installed: ☐ Yes ☐ No	102. Grounding installed per manual: ☐ Yes ☐ No
103. Conduit sealed with RTV: ☐ Yes ☐ No	104. Siren head installed per manual: ☐ Yes ☐ No
105. A/C, Battery & Radio "ON": ☐ Yes ☐ No	106. A/C Disconnect/Breaker location:

Annual Maintenance Inspection Only	
107. Cabinet interior moisture: ☐ Yes ☐ No	108. Pole issue: ☐ Yes ☐ No
109. Lightening damage: ☐ Yes ☐ No	110. Antenna integrity: ☐ Yes ☐ No
111. Cable/Wire integrity: ☐ Yes ☐ No	112. Weather seal inspected: ☐ Yes ☐ No
113. Batteries load tested: ☐ Yes ☐ No	

Notes: (List of individuals trained if applicable)

114. Tested by:	115. Inspection Date:

116. **When complete, email to finvoices@fedsig.com**
For telephone support, please call Technical Support (800) 524-3021.

2645 Federal Signal Drive, University Park, Illinois, 60484 | Technical Support (800) 524-3021 | Customer Support (800) 548-7229

Appendix B Wiring Diagrams

Figure 18 UVIC-B with Radio Wiring Diagram

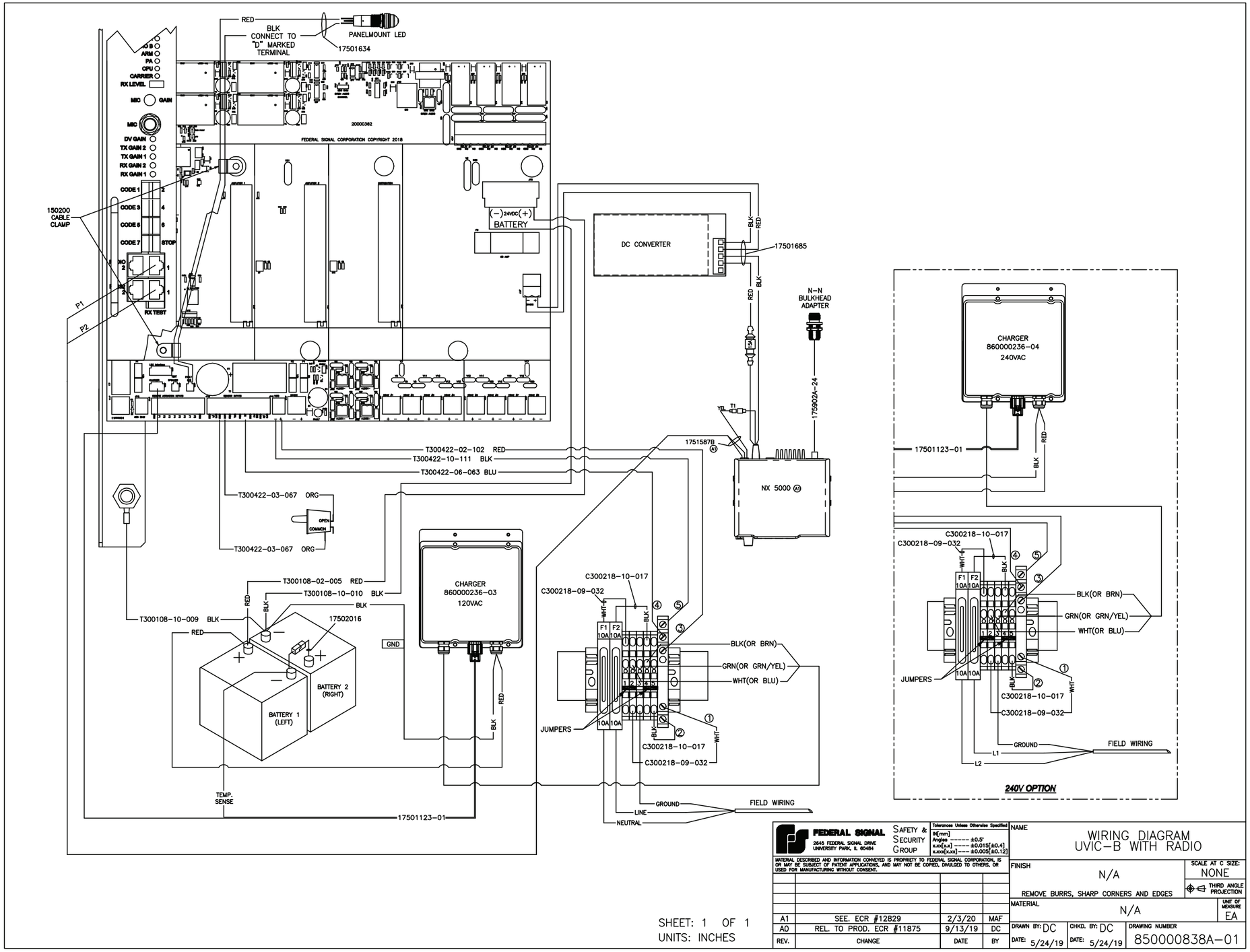


Figure 19 UVIC-B IP-Enabled Wiring Diagram

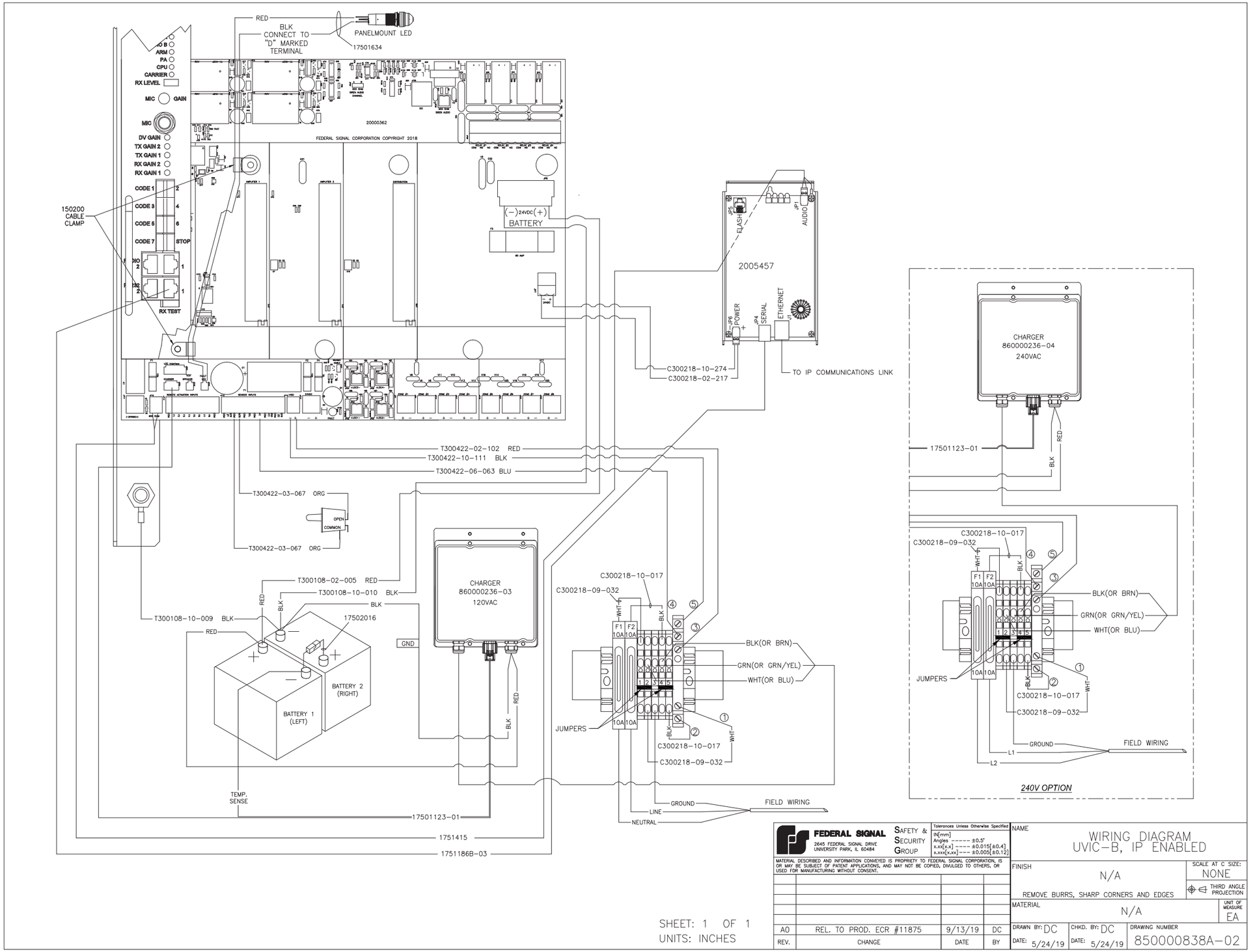
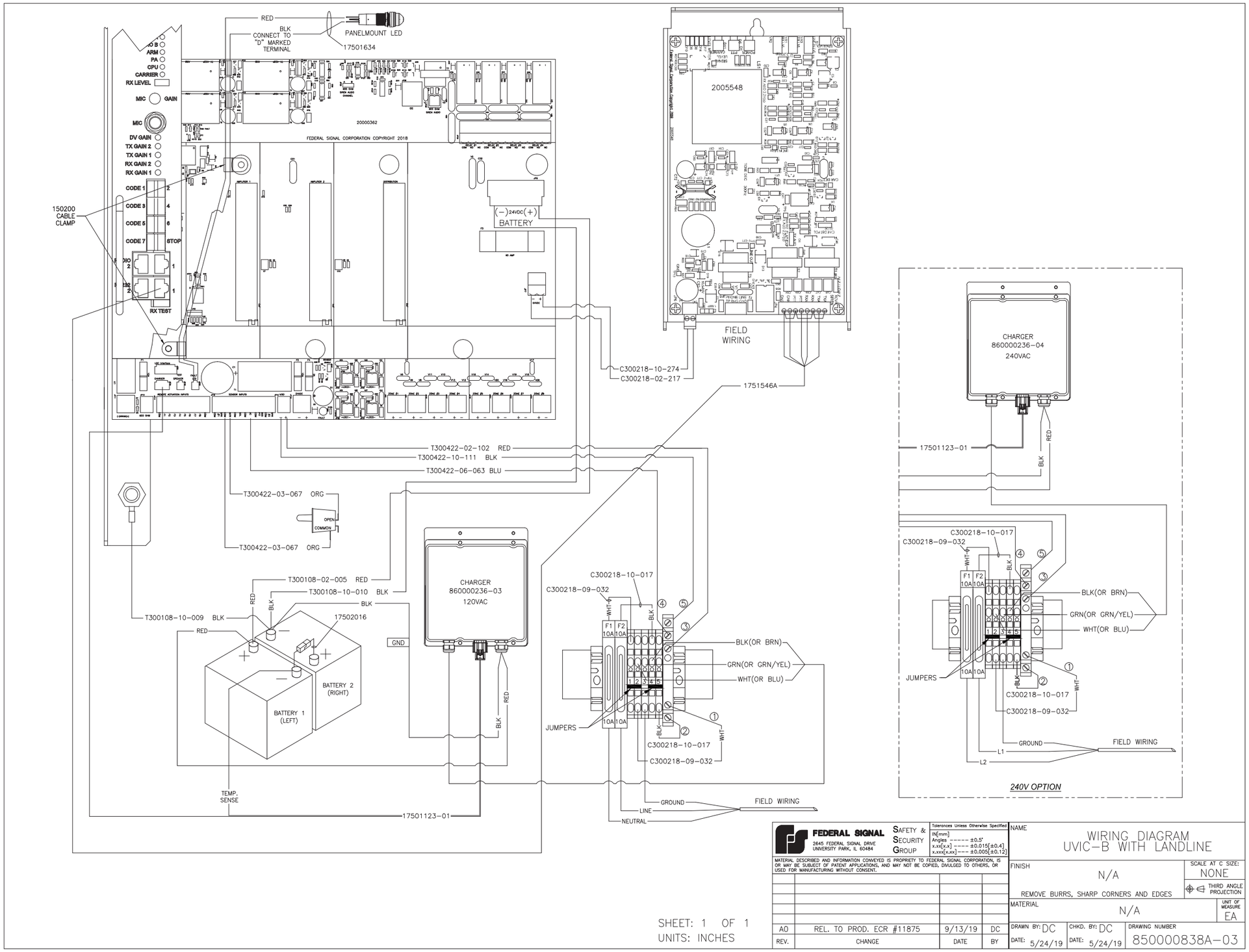



Figure 20 UVIC-B with Landline Wiring Diagram