

## Features

### Emergency voice/alarm communications provide:

- Alarm/evacuation signal generation with multiple built-in tones
- Standard or customized digital message storage and message generation
- Automatic or manual operation
- Mass Notification operation

### Multiple channels are available:

- Analog audio systems provide dual channel operation
- Digital audio systems provide up to eight channels over a single wire pair

### Communications features:

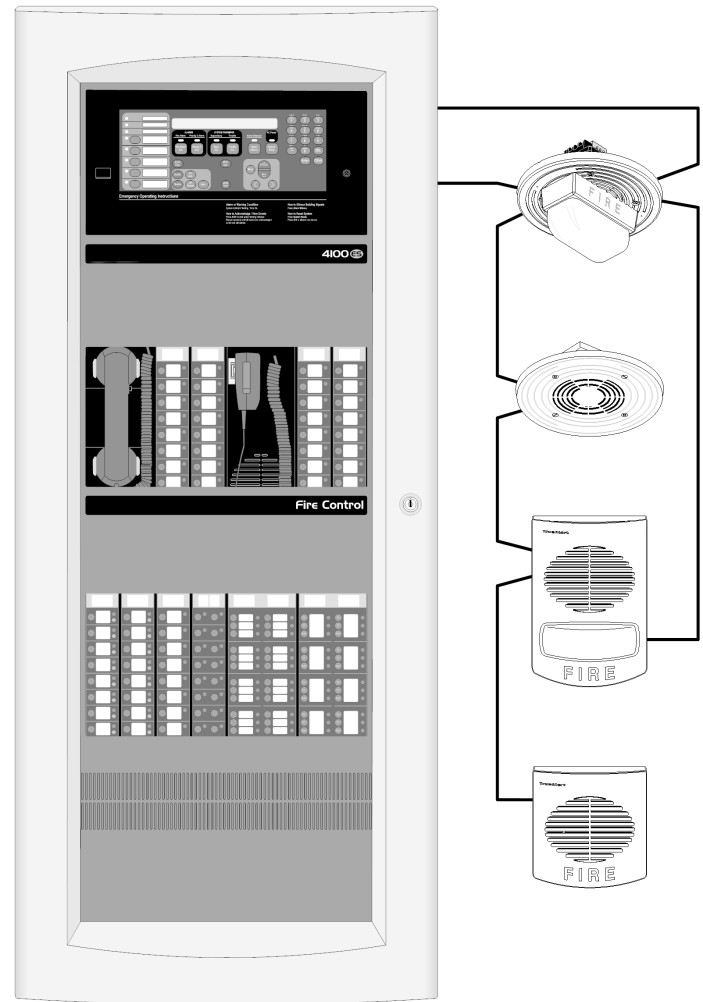
- Up to five supervised remote microphone inputs
- Spoken voice coding from the digital message player
- Multiple digitally recorded human voice messages
- Spoken "walktest" system testing
- Separate evacuation, drill, and optional "All Clear" voice messages and tones
- Ready-to-talk microphone indicator on front panel audio control module
- Local panel speaker for tone/message broadcast verification
- Miniplex Voice Transponders are available for distributed audio

### Amplifiers are available with analog or digital input:

- Flex-35 (35 W) and Flex-50 (50 W) amplifiers provide a dual channel design with configurable operation modes
- 100 W primary and backup, single channel amplifiers include a built-in power supply
- Amplifiers are available for 25 VRMS or 70.7 VRMS output with on-board, power-limited NACs (only one voltage choice per system)
- Built-in Temporal Pattern horn tone provides default backup signal operation
- Optional modules provide power-limited NAC expansion, convert Class B NACs to Class A operation, and provide Constant Supervision Operation for Non-Alarm Audio (NAA) applications (NAA requires additional hardware, and software revision 11.08 or higher)

### Firefighter telephone systems:

- Master telephone can simultaneously talk with up to 6 remote telephones and can be connected as an audio input for broadcast messages
- Ring signal on remote firefighter telephone indicates that a call request is initiated and a hold signal indicates that a connected line has been deselected
- Telephone circuits are supervised for open and short circuits, too many telephones connected, and the master telephone is supervised for cord integrity
- Degraded mode allows remote telephones to remain connected to each other in the event of a communications loss



**Figure 1: 4100ES Fire Alarm Control Panel with Voice and Firefighter Telephone Options**

### Listed to:

- UL 864, Fire Detection and Control (UOJZ), and Smoke Control Service (UUKL)
- UL 2017, Process Management Equipment (QVAX)
- UL 1076, Proprietary Alarm Units-Burglar (APOU)
- UL 2572, Mass Notification Systems (PGWM)
- ULC S527, Control Units for Fire Alarm Systems

## Description

### 4100ES Audio Systems

4100ES Audio Systems provide voice communication, alarm tones, and/or digitally prerecorded voice messages to alert occupants of fire or other emergency situations. Evacuation signaling may be automatically generated via alarm initiated event programs or by firefighting personnel using the operator controls.

### Audio Controller Module Description

**The Audio Controller Module** provides digitized alarm tones and digitally recorded voice messages and message construction, and

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manages both microphone inputs and other auxiliary inputs connected to the optional Auxiliary Audio Input Module. Tones and voice messages are digitally recorded and stored in the audio control module's message memory.

Two versions are available: **Analog** and **Digital**. Systems must be either analog or digital, not intermixed. One audio control module controls the entire audio system.

### Common audio control board features:

- On-board digital message memory provides up to 2 minutes at normal or 1 minute at high resolution
- Connects to optional 4-input audio input modules (two maximum) for a total of up to 6 microphones and 11 distinct audio inputs
- Memory expansion is available to provide up to 8 minutes or 32 minutes at normal resolution (4 minutes or 16 minutes at high resolution)
- Connections for a Master Microphone and one Remote Microphone, compatible with standard or noise-canceling microphones
- Master telephone to audio interface connection uses the audio bay's Power Distribution Interface Module (PDI)
- Local panel speaker output with on-board volume control
- On-board download port for message loading
- The microphone ready-to-talk LED is located on the front panel audio control module (see p. 4) and requires connection to a 64 LED/64 switch controller
- Audio risers, either digital or analog, may be directly connected to 31 remote nodes; for applications requiring audio risers to more than 31 remote nodes, alternate connection methods are available, contact your Autocall product representative for details

### Analog Audio Controller Modules

**Analog audio control modules** are for systems that require one or two simultaneous channels of audio information per the following feature summary.

- Built-in 10 VRMS riser output eliminates the need for separate riser amplifiers available as Class B or Class A
- Messages can play on one or both risers simultaneously, with the same or a different message
- Analog audio controllers are for connection to analog input audio amplifiers and audio risers only
- On-board status LEDs assist with setup and troubleshooting

### Digital Audio Controller Modules

**Digital audio control modules** are for systems that require more than two simultaneous channels of audio information per the following feature summary.

- Up to 8 channels of information at normal resolution are available (4 channels at high resolution) on one twisted wire pair
- Primary 1 Digital Audio Riser (DAR) output can be either wired Style 4 or Style 7; Primary 2 DAR is an identical, separate output for Style 4 connections, typically to local MINIPLEX voice transponders
- Digital audio controllers are for connection to digital input audio amplifiers and digital audio risers only

### Audio Tone List

**The Temporal 3 Pattern** is available for compatible tones (1/2 sec on, 1/2 sec off, 1/2 sec on, 1/2 sec off, 1/2 sec on, 1-1/2 sec off) to indicate evacuation. The following is a list of the standard audio tones.

- **Horn**, continuous 520 Hz tone, primarily used for coded systems or general temporal pattern signaling; 520Hz tone is compliant with NFPA 72 Low Frequency Signal Requirements for Sleeping Areas
- **Chime**, a digitally recorded mechanical chime tone, normally used free-running or for coded operation

- **Bell**, a digitally recorded mechanical bell sound, normally used free-running, for coded systems, or general temporal pattern signaling
- **Fast Whoop**, a quickly ascending tone
- **Slow Whoop**, a slowly ascending tone
- **High/Low**, with high frequency of 750 Hz for 100 ms and low frequency of 500 Hz for 400 ms
- **Beep**, 500 Hz tone of 0.7 s on, 0.7 s off
- **Stutter**, 500 Hz tone with on and off times of 100 ms
- **Wail**, ascends, then descends between 600 to 940 Hz
- **GSA Tone**, continuous 2000 Hz tone

### Audio Controller Message Description

**Zone Coded Signaling** is available using tones or spoken numbers. Spoken coded messages can be used in place of conventional pulse tone coding to eliminate counting and interpretation of the zone coded location. For example, a fire alarm zone such as First Floor East, smoke Detector Room 23 will be Code 1123.

Two possible transmission schemes are:

1. Conventional Zone Coded Signaling where T = Tone:  
**T...T...TT...TTT...T...T...TT...TTT...**
2. Spoken Coded Signaling: *Code, one..one..two..three; Code, one..one..two..three*

The Audio Controller has the ability to precede spoken codes with phrases and alert tones. As an alternative, the previous example could have been preceded with a chime tone. The word "code" could be replaced with the phrase "Doctor Firestone, please dial..."

**Preprogrammed Special Messages** can be ordered. Up to 32 minutes of special phrases and messages are available to meet specific applications. The standard Evacuation Message is: *"Attention... Attention... Attention...An emergency has been reported.... All occupants walk to the nearest stairway exit and walk down to your assigned re-entry floor or main lobby... Do not use the elevator... Walk to the nearest stairway.... Do not use the elevator.... Walk to the nearest stairway."*

**Custom Message Ordering** is summarized below:

**Table 1: Custom Message Ordering**

| Model     | Description                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------|
| A100-8804 | Select when <b>Custom Messages are required</b> , choose message types from below as required<br><br>(minimum quantity of one) |

### Audio Amplifiers General Description

**4100ES audio amplifiers** are available as dual channel models rated for 35 W (Flex-35) or 50 W (Flex-50) and as single channel 100 W models with on-board NACs (notification appliance circuits) for convenient field wiring. Common features are summarized as follows:

- **Analog** input amplifier models are for single or dual channel system operation
- **Digital** input amplifier models are for multi-channel system operation providing up to eight channels over a single twisted wire pair
- Amplifiers are power-limited with models available providing 25 VRMS, or 70.7 VRMS output
- When Non-Alarm Audio (NAA) applications (such as for background music, paging, or for Mass Notification) are required, optional Constant Supervision modules provide continued speaker zone supervision during the page or while background music is playing; due to the NAA supervision requirements, when amplifiers are used for paging or playing background music, output power is derated to 70% of alarm output rating (24.5 W, 35 W, and 70 W); during alarm conditions full amplifier output power is available
- Linear power output stages are traditional Class B designs for low

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distortion and low EMI

- An on-board 500 Hz temporal pattern horn tone on each amplifier provides a default backup tone
- Supervision actively monitors amplifier gain in real time, comparing output level to input level
- On-board test switches can be activated to test and observe amplifier backup
- On-board overcurrent protection protects against overloads and short circuits
- Each amplifier communicates to the host CPU and allows voltage and current values to be accessed from the fire alarm control panel operator interface

### Flex-35 and Flex-50 Amplifiers, General

**Flex-35 and Flex-50 amplifiers** are a *self-backup dual channel design* that provides a total of 35 W or 50 W of audio power with the following common feature summary:

- Self-backup feature allows NACs connected to a disabled amplifier channel to be routed to the remaining channel with the full 35 W or 50 W providing the single channel as selected by the fire alarm control panel programming; external backup amplifiers are not required
- Three standard on-board audio NACs are each rated for 2 A maximum and are capable of being routed to either desired amplifier channel
- Compatible power supplies include the: Expansion Power Supply (XPS), Remote Power Supply (RPS), or System Power Supply (SPS); power supplies with single amplifiers can provide power for other compatible applications within their rated output
- Digital models of the Flex-35 and Flex-50 have a digital decoder module that selects one or two of the input channels as desired
- Selectable reduced output levels of -12 dB or -6 dB are available for non-emergency audio output, selectable per channel

### Flex-35 Amplifiers

- Each Flex-35 channel is capable of up to 35 W output with a total of 35 W
- Channels can be divided as 0 W and 35 W; 17.5 W and 17.5 W; 10 W and 25 W; or any combination that totals 35 W or less

### Flex-50 Amplifiers

- Each Flex-50 channel is capable of up to 50 W output with a total output of 50 W
- Channels can be divided as 0 W and 50 W; 25 W and 25 W; 10 W and 40 W; or any combination that totals 50 W or less

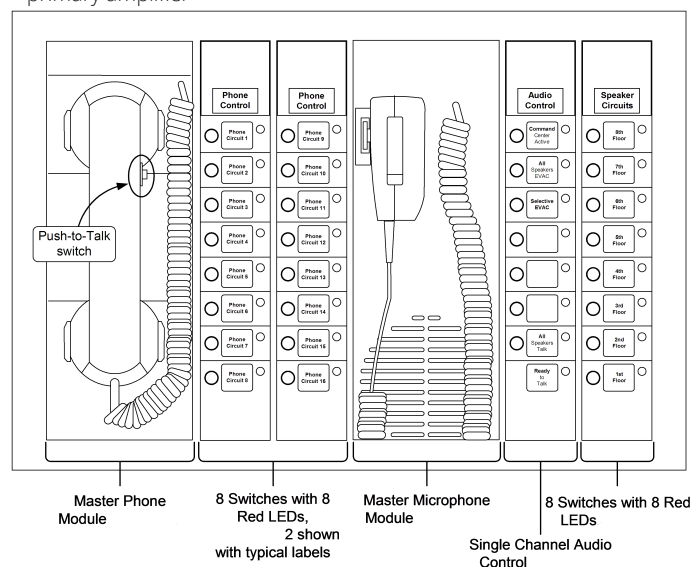
### Dual Flex-35 or Flex-50 Connections

- Two Flex-35 amplifiers, or two Flex-50 amplifiers can connect to a single Expansion Power Supply (XPS) in the same audio expansion bay (amplifiers must be the same model number); XPS output is dedicated to amplifier power
- Mounting for dual Flex-35 or Flex-50 amplifiers is Blocks A & B for amplifier 1, Blocks C & D for the XPS, blocks E & F are not used, and Blocks G & H are for amplifier 2

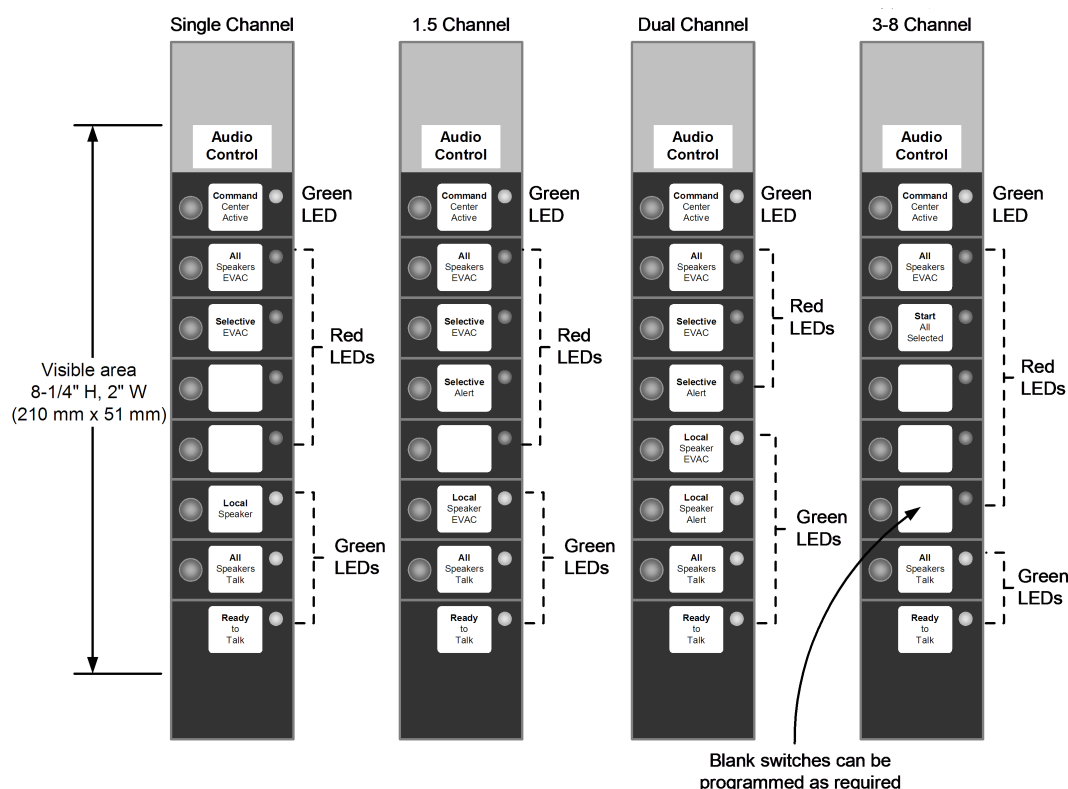
### 100 W Audio Amplifiers

**100 W amplifiers** provide single channel operation per the following feature summary:

- Six standard on-board Class B audio NACs are each rated for 2 A maximum
- 100 W amplifiers include a built-in power supply and use system battery backup
- Amplifier and power supply size requires four continuous blocks of expansion bay size
- A single 100W primary amplifier or both a primary and a backup amplifier can be located on a single expansion bay (refer to page 7 for bay loading)
- Redundant (backup) amplifiers interconnect directly to minimize wiring connections and their power is routed through the NACs of the primary amplifier



## Audio Control Modules



## Emergency Voice/Alarm Communications Equipment Product Selection

**Note:** Select systems as either analog or digital. When amplifiers are used for Non-Alarm Audio paging or background music with Constant Supervision, *output power is derated to 70% of alarm power* (24.5 W, 35 W, and 70 W); full output is available for alarm.

**Table 2: Analog Emergency Voice/Alarm Communications Equipment, Constant Supervision Compatible**

| Model     | Description                                                                              |                                                          | Details                                                                                                    |                           |                                                                                         |
|-----------|------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------|
| A100-9620 | Basic Analog Audio Operation with microphone, requires dedicated expansion bay           |                                                          | Includes: Expansion Bay, A100-1210 Analog Controller Board, Microphone Module, and Audio Expansion Bay Kit |                           |                                                                                         |
| A100-1210 | Analog Controller Board only; order expansion bay and audio expansion bay kit separately |                                                          | Controller board mounts in Blocks A and B                                                                  |                           |                                                                                         |
| A100-1361 | 25 VRMS output                                                                           | Flex-35, 35 W Amplifier, constant supervision compatible | NAC rating = 1.4 A                                                                                         | 35W, or 100 speakers max. | Includes three on-board Class B audio NACs; power is supplied from an XPS, RPS, or SPS* |
| A100-1362 | 70.07 VRMS output                                                                        |                                                          | NAC rating = 0.5 A                                                                                         |                           |                                                                                         |
| A100-1312 | 25 VRMS output                                                                           | Flex-50, 50 W Amplifier, constant supervision compatible | NAC rating = 2 A                                                                                           | 50W, or 100 speakers max. |                                                                                         |
| A100-1313 | 70.7 VRMS output                                                                         |                                                          | NAC rating = 0.707 A                                                                                       |                           |                                                                                         |

**Table 3: 100 W Analog Amplifiers with Power Supply, Constant Supervision Compatible**

| Model/Output Voltage |           | Power Supply Input/Listing |    | Description             | Details                                                                                                                |
|----------------------|-----------|----------------------------|----|-------------------------|------------------------------------------------------------------------------------------------------------------------|
| 25 VRMS              | 70.7 VRMS |                            |    |                         |                                                                                                                        |
| A100-1314            | A100-1315 | 120 VAC, 60 Hz             | UL | Primary 100 W Amplifier | Includes six, Class B audio NACs; NAC rating = 100 speakers maximum; 2 A @ 25 VRMS (50 W); 1.414 A @ 70.7 VRMS (100 W) |
| A100-1318            | A100-1319 | 220/230/240 VAC, 50/60 Hz  | UL | Primary 100 W Amplifier | Includes six, Class B audio NACs; NAC rating = 100 speakers maximum; 2 A @ 25 VRMS (50 W); 1.414 A @ 70.7 VRMS (100 W) |

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**Table 3: 100 W Analog Amplifiers with Power Supply, Constant Supervision Compatible**

| Model/Output Voltage |           | Power Supply Input/Listing |    | Description            | Details                                        |
|----------------------|-----------|----------------------------|----|------------------------|------------------------------------------------|
| 25 VRMS              | 70.7 VRMS |                            |    |                        |                                                |
| A100-1320            | A100-1321 | 120 VAC, 60 Hz             | UL | Backup 100 W Amplifier | Uses the six Class B NACs of primary amplifier |
| A100-1324            | A100-1325 | 220/230/240 VAC, 50/60 Hz  | UL | Backup 100 W Amplifier | Uses the six Class B NACs of primary amplifier |

**Note:** ULC models have low battery dropout circuit.

**Table 4: Digital Emergency Voice/Alarm Communications Equipment, Constant Supervision Compatible**

| Model     | Description                                                                                             |                                                          | Details                                                                                                     |                            |                                                                                                                                                    |
|-----------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| A100-9621 | Basic Digital Audio Operation with microphone, requires dedicated expansion bay                         |                                                          | Includes: Expansion Bay, A100-1311 Digital Controller Board, Microphone Module, and Audio Expansion Bay Kit |                            |                                                                                                                                                    |
| A100-1311 | Eight Channel Digital Controller Board only; order expansion bay and audio expansion bay kit separately |                                                          | Controller board mounts in Blocks A and B                                                                   |                            |                                                                                                                                                    |
| A100-1363 | 25VRMS output                                                                                           | Flex-35, 35 W Amplifier, constant supervision compatible | NAC rating = 1.4 A                                                                                          | 35W, or 100W speakers max. | Includes three on- board Class B audio NACs; power is supplied from an XPS, RPS, or SPS. Refer to data sheet AC4100-0031 for power supply details. |
| A100-1364 | 70.07VRMS output                                                                                        |                                                          | NAC rating = 0.5 A                                                                                          |                            |                                                                                                                                                    |
| A100-1326 | 25VRMS output                                                                                           | Flex-50, 50 W Amplifier, constant supervision compatible | NAC rating = 2 A                                                                                            | 50W, or 100W speakers max. |                                                                                                                                                    |
| A100-1327 | 70.7VRMS output                                                                                         |                                                          | NAC rating = 0.707 A                                                                                        |                            |                                                                                                                                                    |

**Table 5: 100 W Digital Amplifiers with Power Supply, Constant Supervision Compatible**

| Model/Output Voltage |           | Power Supply Input/Listing |    | Description             | Details                                                                                                                |
|----------------------|-----------|----------------------------|----|-------------------------|------------------------------------------------------------------------------------------------------------------------|
| 25 VRMS              | 70.7 VRMS |                            |    |                         |                                                                                                                        |
| A100-1328            | A100-1329 | 120 VAC, 60 Hz             | UL | Primary 100 W Amplifier | Includes six, Class B audio NACs; NAC rating = 100 speakers maximum; 2 A @ 25 VRMS (50 W); 1.414 A @ 70.7 VRMS (100 W) |
| A100-1332            | A100-1333 | 220/230/240 VAC, 50/60 Hz  | UL | Primary 100 W Amplifier | Includes six, Class B audio NACs; NAC rating = 100 speakers maximum; 2 A @ 25 VRMS (50 W); 1.414 A @ 70.7 VRMS (100 W) |
| A100-1334            | A100-1335 | 120 VAC, 60 Hz             | UL | Backup 100 W Amplifier  | Uses the six Class B NACs of primary amplifier                                                                         |
| A100-1338            | A100-1339 | 220/230/240 VAC, 50/60 Hz  | UL | Backup 100 W Amplifier  | Uses the six Class B NACs of primary amplifier                                                                         |

**Note:** ULC models have low battery dropout circuit.

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### Audio Options for use with either Analog or Digital Systems

**Table 6: Amplifier and Related Audio Options**

| Model      | Description                                                                                                                            |                                                                                                                                |                                                                                                                                                                                                                               | Details and Mounting Reference                                                                                                    |                                                                                                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A100-1245  | Flex-35/50 Expansion NAC Module; adds three Class B audio NACs                                                                         |                                                                                                                                | Choose one per amplifier                                                                                                                                                                                                      | Mounts on Flex-35/50 assembly; NAC ratings = 1.5 A, 35/50 W, or 100 speakers maximum; <i>Supv.</i> = 8.4 mA, <i>Alarm</i> = 60 mA |                                                                                                                                                                                    |
| A100-1246  | Flex-35/50 Class A Adapter Module; converts three on-board NACS to Class A operation                                                   |                                                                                                                                |                                                                                                                                                                                                                               | Mounts on Flex-35/50 assembly; NAC ratings = 2 A, 50 W, or 100 speakers maximum; <i>Supv.</i> = 1 mA, <i>Alarm</i> = 30 mA        |                                                                                                                                                                                    |
| A100-1248  | 100W Amplifier Expansion NAC Module; NAC ratings = 1.5 A, 50 W, or 100 speakers max.                                                   |                                                                                                                                | Choose one per amplifier                                                                                                                                                                                                      | Provides six additional Class B audio NACs, mounts on 100 W amplifier assembly; <i>Supv.</i> = 17 mA, <i>Alarm</i> = 60 mA        |                                                                                                                                                                                    |
| A100-1249  | 100W Class A Adapter Module; NAC ratings =2 A, 50 W, or 100 speakers maximum                                                           |                                                                                                                                |                                                                                                                                                                                                                               | Converts six on-board NACs to Class A operation, mounts on 100 W amplifier assembly; <i>Supv.</i> = 1 mA, <i>Alarm</i> = 60 mA    |                                                                                                                                                                                    |
| A100-1259  | 25VRMS Output; NAC rating = 2 A, 50 W, or 100 speakers maximum                                                                         | Constant Supervision Adapter for three NACs; select per amplifier output (not compatible with amplifier NAC expansion modules) | <i>Supv.</i> = 10 mA on batteries; <i>Alarm</i> = 35 mA                                                                                                                                                                       |                                                                                                                                   | Converts three Class B audio NACS to Class A or Class B Constant Supervision NACs; mounts on Flex-35/50 or 100 W amplifier assembly; use two for the six NACs on 100 W amplifiers; |
| A100-1260  | 70.7VRMS Output; NAC rating= 0.707 A, 50 W, or 100 speakers maximum                                                                    |                                                                                                                                | <i>Supv.</i> = 38 mA <i>Alarm</i> = 70 mA                                                                                                                                                                                     |                                                                                                                                   |                                                                                                                                                                                    |
| A100-5116  | Expansion Signal Module; three, 1.5 A Class B NACs; up to five maximum per amplifier; NAC rating= 1.5 A, 50 W, or 100 speakers maximum |                                                                                                                                | Converts one NAC input to three NAC outputs; selects between two inputs; for Flex-35/50 amplifiers only, two input NACs are required; Single Block module mounts in expansion bay; <i>Supv.</i> = 20 mA; <i>Alarm</i> = 80 mA |                                                                                                                                   |                                                                                                                                                                                    |
| A100-1266  | Expansion Signal Module NAC Expander; NAC rating = 1.5 A, 50 W, or 100 speakers maximum                                                |                                                                                                                                | Expands module capacity to six, Class B NACs; <i>Supv.</i> = 0.84 mA; <i>Alarm</i> = 60 mA                                                                                                                                    |                                                                                                                                   | These modules mount on the A100-5116; select one max. per A100-5116 as required                                                                                                    |
| A100-1267  | Expansion Signal Module Class A Adapter; NAC rating = 1.5 A, 50 W, or 100 speakers maximum                                             |                                                                                                                                | Converts3 Class B, NACs to Class A; <i>Supv.</i> = 1 mA; <i>Alarm</i> = 30 mA                                                                                                                                                 |                                                                                                                                   |                                                                                                                                                                                    |
| A100-1268  | Expansion Signal Module Constant Supervision Adapter for 25 VRMS or 70.7 VRMS; NAC rating =1.4 A, 50 W, or 100 speakers maximum        |                                                                                                                                | Converts 3 Class B NACs to Class B or Class A Constant Supervision NACs; <i>Supv.</i> = 38 mA on batteries (constant supervision deactivated); <i>Alarm</i> = 70 mA                                                           |                                                                                                                                   |                                                                                                                                                                                    |
| A4081-9018 | End-of-line resistor harness for 70.7 VRMS NACs; 10 k ohm,1 W                                                                          |                                                                                                                                |                                                                                                                                                                                                                               |                                                                                                                                   |                                                                                                                                                                                    |
| A100-2300  | Expansion Bay Hardware; <b>order one for each expansion bay</b>                                                                        |                                                                                                                                |                                                                                                                                                                                                                               |                                                                                                                                   |                                                                                                                                                                                    |
| A100-2320  | Audio Bay-to-Bay Interconnection Harness Kit; <b>order one for each audio bay addition</b>                                             |                                                                                                                                |                                                                                                                                                                                                                               |                                                                                                                                   |                                                                                                                                                                                    |
| A100-0637  | Audio Box Interconnection Harness Kit; <b>order one for each close-nipped audio cabinet</b>                                            |                                                                                                                                |                                                                                                                                                                                                                               |                                                                                                                                   |                                                                                                                                                                                    |

**Table 7: Audio Input and Controller Options**

| Model     | Description                                                                               | Details and Mounting Reference                                                                                  |                                   |
|-----------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------|
| A100-1240 | Auxiliary Audio Input Module; four additional (unsupervised) inputs per module; 2 maximum | Inputs for 10 VRMS, 25 VRMS, 70.7 VRMS, line level (0.707 VRMS), or microphone; 1 Block; <b>current = 10 mA</b> |                                   |
| A100-1241 | 8 Minute Message Expansion Module                                                         | Provides 8 minutes at normal resolution or 4 minutes at high resolution; <b>Supv. = 2 mA; Active = 17 mA</b>    | Mounts to audio controller module |
| A100-1242 | 32 Minute Message Expansion Module                                                        | Provides 32 minutes at normal resolution or 16 minutes at high resolution; <b>Supv. = 2 mA; Active = 17 mA</b>  |                                   |

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**Table 8: Operator Interface and Related Options**

| Model      | Description                                                                    | Details and Mounting Reference                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |
|------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| A100-1243  | Microphone Module (mike); for Fire Alarm Control Panels                        | One maximum per audio system; front panel module that requires 2 Slots (4"), locate on expansion bay only; space behind for 4100ES flat modules only         |                                                                                                                                                                                                                                                                                                                                                                         | Supervisory current = 2.4 mA, Active current = 6 mA                        |
| A100-1244  | Remote Microphone Module; for Remote Annunciator Panels                        | Front panel module that requires 2 Slots (4"), locate on expansion bay only; space behind for 4100ES flat modules only; distance limited to 4000 ft (1219 m) |                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |
| A4003-9803 | Remote Microphone Module                                                       | Mounted on plate with controls, for 2-gang box mount; see data sheet AC4100-0053 for details                                                                 |                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |
| A100-1252  | 1 Channel (audio or mike)                                                      | Operator Interface LED/Switch Modules                                                                                                                        | Single Slot LED/switch modules; connects to a A100-1288 or A100-1289 LED/switch controller in the same bay; space behind controller accepts 4100ES flat modules only; <b>current = 24 mA</b> ; Additional adjacent LED/switch modules, are used as required for specific speaker circuit selection (refer to data sheet AC4100-0032 for LED/switch module availability) |                                                                            |
| A100-1253  | 1.5 Channel (audio + mike)                                                     |                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |
| A100-1254  | 2 Channel (full audio)                                                         |                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |
| A100-1255  | 3-8 Channel (8 channel normal res. messages, 4 channels of high res. messages) |                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                         |                                                                            |
| A100-1288  | 64 LED/64 Switch Controller Module with mounting plate                         | Refer to data sheet AC4100-0032 for details                                                                                                                  | Mounts behind the LED/switch modules; has provisions for one A100-1289 Controller Module                                                                                                                                                                                                                                                                                | LED/switch controllers and their connected modules must be in the same bay |
| A100-1289  | 64 LED/64 Switch Controller Module without mounting plate                      |                                                                                                                                                              | Mounts on extra space of A100-1288; controls additional 64 LEDs and 64 switches                                                                                                                                                                                                                                                                                         |                                                                            |

**Table 9: Firefighter Telephone System Products**

| Model     | Description                                                                                                                                                                   | Details and Mounting Reference                                                                                                                                                                                                                              |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A100-1270 | Master Telephone with Control Module and three Class B telephone NACs, one maximum per audio system; for use in Fire Alarm Control Panels only; includes one A100-1272 Module | Front panel module; space behind for 4100ES flat modules only; phone control module included, mounted on bay module mounting plate; for individual telephone circuit control, use LED/switch modules; <b>Supv. = 80 mA; in use = 140 mA + remote phones</b> |
| A100-1271 | Remote Master Telephone                                                                                                                                                       | Mounts in Remote Annunciator Panel only (see AC4100-0038)                                                                                                                                                                                                   |
| A100-1272 | Expansion Telephone Control Module with three Class B telephone NACs                                                                                                          | Expansion module for additional telephone circuits in main control or transponders; <b>Supv. = 80 mA; in use = 140 mA + remote phones</b>                                                                                                                   |
| A100-1273 | Telephone NAC Class A Adapter Module                                                                                                                                          | Mounts to A100-1270 or A100-1272; no additional current required                                                                                                                                                                                            |

**Table 10: Network and MINIPLEX Transponder Audio Connection Options**

| Model     | Description                                                                                   | Details                                                                                                                                                                                                                                                                                          |
|-----------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A100-0623 | Network Audio Riser Controller Module for control of either an analog or digital riser module | Typically for Network nodes without an audio controller, used for NAA applications; mounts in Block A; <b>current = 14 mA</b>                                                                                                                                                                    |
| A100-0621 | Dual Channel <b>Analog</b> Audio Riser Module                                                 | Select one, mounts in Block B<br>Accepts two separate audio signals from host; controlled by Transponder Interface Module; <b>current = 25 mA when active</b><br>Receives and decodes digital inputs; up to eight audio channels; <b>current = 70 mA</b> ; NAA input for 25, 70.7, or 0.707 VRMS |
| A100-0622 | 3-8 Channel <b>Digital</b> Audio Riser Module; with NAA input                                 |                                                                                                                                                                                                                                                                                                  |

## 4100ES Addressable Fire Detection and Control Emergency Voice/Alarm Communications Equipment

**Table 10: Network and MINIPLEX Transponder Audio Connection Options**

| Model     | Description                                                 | Details                                                                                                                                                       |
|-----------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A100-1341 | MCC (Multiple Command Center) Digital Audio Riser Interface | Selects a single digital audio channel and converts it to an analog line level for input to an analog 4100ES/ 4100 Legacy voice panel; <b>current = 70 mA</b> |

### Firefighter Telephone System Description

**Firefighter telephone systems provide** two-way communications for facilities where radio communications may not be available or are unreliable. They are typically used during active firefighting conditions, during a fire alarm investigation, or during fire alarm system inspection and test.

**System Operation.** Connections are made using a common talk line (party line) that includes a Master Telephone and up to six remote telephones. Remote telephones call into the Master by either being taken off-hook or by being plugged into a telephone jack. The Master Telephone location receives a ring-in tone with a visible LED indicator for each telephone circuit. When the call is received, the operator selects the calling telephone circuit using the assigned switch control. The operator at the master location can place the original telephone circuit on hold and connect to additional telephone circuits or add them to the talk line.

**Master Telephone Operation.** The Master Telephone connects directly into a telephone interface module. A Push-to-Talk (PTT) switch provides the operator with voice input control. Each master telephone uses local LED/switch modules to select telephone circuits and to silence any subsequent call-ins until selected.

**Telephone Circuit Control.** A call request causes the local call-in tone sounder and assigned telephone circuit LED to pulse quickly. Pushing the calling circuit's switch silences the local sounder and connects that circuit to the talk line. Activating the switch again places that circuit on hold with a hold tone being heard at the remote telephones and causing that circuit's LED to pulse slowly. Subsequent pushes toggles from active to hold. Activating a telephone circuit switch when no call is incoming places a request to pick up on remote telephones equipped with local LEDs. Master telephones can be also be connected as an input to an audio controller module to allow audio system message broadcasting without using a microphone.

**Remote Master Telephones** mount in Remote Annunciator Cabinets and are wired as the only connection to a telephone circuit. By adding local LED/switch modules, operation is that of the Master Telephone.

**Remote telephones** are available cabinet mounted or for plugging into a dedicated telephone jack. Each hears a ring tone when a call-in is selected and a hold tone when placed on hold. When on hold, the remote telephones are each separated from the talk line.

**The Telephone Interface Module** provides three Class B (Class A option is available) telephone circuits, connection for a master telephone, and a telephone riser input. One module is supplied when selecting a Master Telephone. Additional telephone interface modules can be added as required. Telephone circuit outputs can be programmed as remote telephones, as a Remote Master, or for telephone riser operation. Telephone circuits are supervised for opens, shorts, and overload conditions. The Master Telephone is supervised for broken cord or off-hook.

**Telephone riser operation** can be programmed to provide a telephone riser output that is used to interconnect telephone interface modules in different locations. This output type has ring and hold tones disabled.

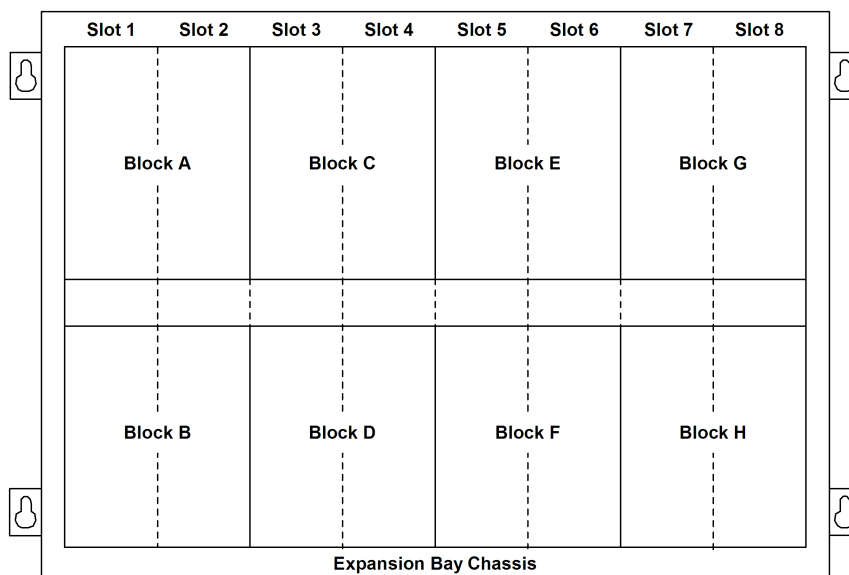
**Degraded Mode.** If the telephone interface module loses communications with the host fire alarm control panel, telephone circuits off-hook are automatically connected to the talk line allowing any telephone to talk to another simply by being picked up (or plugged in).

**Master Telephone Control Current with Remote Telephones.** The following table lists Master Telephone Control current with the addition of remote firefighter telephones.

**Table 11: Master telephone control current**

| Remote Phones | Current (mA) |
|---------------|--------------|
| 0             | 140          |
| 1             | 180          |
| 2             | 220          |
| 3             | 250          |
| 4             | 276          |
| 5             | 304          |
| 6             | 329          |

## Expansion Bay Module Loading Reference



### Size Definitions

- Block = 4" W x 5" H (102 mm x 127 mm) card area
- Slot = 2" W x 8" H (51 mm x 203 mm) motherboard with daughter card

**Table 12: Expansion Bay Module Loading Reference**

| Description                                                                                          | Mounting                                                     |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Audio Controller Modules                                                                             | Blocks A & B                                                 |
| Network Riser Controller Module                                                                      | Block A                                                      |
| Audio Riser Modules                                                                                  | Block B                                                      |
| SPS or RPS                                                                                           | Blocks E, F, G & H ONLY                                      |
| XPS                                                                                                  | Blocks G & H ONLY*                                           |
| Flex-35 Amplifiers, 2 max /bay*                                                                      | Blocks E & F; C & D;<br>or A & B                             |
| Flex-50 Amplifiers, 2 max/bay*                                                                       | Blocks E & F or C & D                                        |
| 100 W Amplifiers, 1 max/bay                                                                          | Blocks E, F, G & H                                           |
| 100 W Backup Amplifiers, 1 max. per bay with primary amplifier                                       | Blocks A, B, C & D                                           |
| Master or Remote Phone Module                                                                        | Blocks A & B                                                 |
| Master or Remote Microphone Module                                                                   | Two vertical Blocks, any location (except next to telephone) |
| Telephone Module                                                                                     | 1 Block                                                      |
| Expansion Signal Module                                                                              | 1 Block                                                      |
| Operator LED/Switch Modules                                                                          | 1 Slot                                                       |
| NPU to 4100ES Audio Interconnect Module                                                              | 1 Block                                                      |
| <b>Note:</b> * When mounting dual Flex amplifiers on an expansion bay, special mounting rules apply. |                                                              |

## 4100ES Addressable Fire Detection and Control Emergency Voice/Alarm Communications Equipment

### General Specifications

**Table 13: Input Power**

| Specification                                       | Rating                                                                                      |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------|
| Power Supplies; SPS, XPS, RPS, and 100 W Amplifiers | 120 VAC Models<br>4 A maximum @ 102 to 132 VAC, 60 Hz                                       |
|                                                     | 220-240 VAC Models<br>2 A maximum @ 204 to 264 VAC, 50/60 Hz; with taps for 220/230/240 VAC |

**Table 14: Amplifier Ratings**

| Specification                                                                                                                                | Rating                                                                                                      |                                                               |                                             |  |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------|--|
| Built-in Tones                                                                                                                               | 500 Hz horn tone operated at temporal pattern, provided when amplifiers are separated from audio controller |                                                               |                                             |  |
| Flex-35 Amplifiers:<br><br>A100-1361, A100-1362, A100-1363, A100-1364                                                                        | Input Voltage                                                                                               | 19 to 35 VDC from adjacent power supply                       |                                             |  |
|                                                                                                                                              | Supervisory Current                                                                                         | 425 mA with power stage supervised                            |                                             |  |
|                                                                                                                                              |                                                                                                             | 85 mA in low power mode                                       |                                             |  |
|                                                                                                                                              | Alarm Current @ full output power                                                                           | 5.5 A with continuous horn tone                               | Use this value for power supply loading     |  |
|                                                                                                                                              |                                                                                                             | 1.64 A average, with temporal pattern horn                    | Use this value for battery backup reference |  |
| Flex-50 Amplifiers:<br><br>A100-1312, A100-1313, A100-1326, A100-1327                                                                        | Input Voltage                                                                                               | 19 to 35 VDC from adjacent power supply                       |                                             |  |
|                                                                                                                                              | Supervisory Current                                                                                         | 425 mA with power stage supervised                            |                                             |  |
|                                                                                                                                              |                                                                                                             | 85 mA in low power mode                                       |                                             |  |
|                                                                                                                                              | Alarm Current @ full output power                                                                           | 5.55 A with continuous horn tone                              | Use this value for power supply loading     |  |
|                                                                                                                                              |                                                                                                             | 2.27 A average, with temporal pattern horn                    | Use this value for battery backup reference |  |
| 100 W Amplifiers and Backup Amplifiers:<br><br>A100-1314, A100-1318, A100-1320, A100-1324;<br><br>A100-1328, A100-1332, A100-1334, A100-1338 | Supervisory Current                                                                                         | 400 mA (analog); 220 mA (digital) with power stage supervised |                                             |  |
|                                                                                                                                              |                                                                                                             | 85 mA in low power mode                                       |                                             |  |
|                                                                                                                                              | Alarm Current @ full output power                                                                           | 9.6 A with continuous horn tone                               |                                             |  |
|                                                                                                                                              |                                                                                                             | 3.8 A average, with temporal pattern horn                     | Use this value for battery backup reference |  |
| Total Amplifier Power per Cabinet                                                                                                            | 300 W maximum                                                                                               |                                                               |                                             |  |

**Table 15: Audio Controller Ratings**

| Specification                                                                                                                                  | Rating                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Current Requirements</b>                                                                                                                    | A100-9620, A100-1210<br>Analog = 225 mA supervisory                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                | A100-9621, A100-1311<br>Digital = 85 mA supervisory                                                                                                                                                                                                                                                                                  |
| <b>Analog Riser Distance</b>                                                                                                                   | Up to 10,000 ft (3048m) total with 18 AWG (0.82 mm <sup>2</sup> ) shielded twisted pair (STP)                                                                                                                                                                                                                                        |
| <b>Digital Riser Distance:</b> 18 AWG unshielded, twisted pair (UTP) required, except as noted (refer to Installation Instructions 574-844AC)* | Up to 2500 ft (762 m) from A100-1311 Digital Controller to A100-0622 Digital Audio Riser or A100-1341 MCC Digital Riser Interface; up to 2500 ft (762 m) between A100-0622 Digital Audio Riser Modules or A100-1341 MCC Digital Riser Interfaces (signal is reformatted and repeated); wire runs over 100 ft (30 m) require UTP wire |

**Note:** \* Wire runs of 100 ft (30 m) or less require shielded twisted pair wire (STP)

**Table 16: Firefighter Telephone Distance Ratings**

| Specification | Rating                                                                          |
|---------------|---------------------------------------------------------------------------------|
| Distance      | 7500 ft (2286 m) distance to farthest phone, 18 AWG shielded twisted pair (STP) |

**Table 17: Battery Charger, System and Remote Power Supply (sealed lead-acid batteries)**

| Specification                           | Rating                                                                                                                                                              |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Battery capacity range                  | UL listed for battery charging of 6.2 Ah up to 110 Ah (batteries larger than 50 Ah require a remote battery cabinet); ULC listed for charging up to 50 Ah batteries |
| Charger characteristics and performance | Temperature compensated, dual rate, recharges depleted batteries within 48 hours per UL Standard 864, to 70% capacity in 12 hours per ULC Standard S527             |

**Table 18: Environmental and Installation Instruction Reference**

| Specification               | Rating                     |
|-----------------------------|----------------------------|
| Operating Temperature Range | 32° to 120°F (0° to 49° C) |

## 4100ES Addressable Fire Detection and Control Emergency Voice/Alarm Communications Equipment

**Table 18: Environmental and Installation Instruction Reference**

| Specification                       | Rating                                               |           |                                  |           |
|-------------------------------------|------------------------------------------------------|-----------|----------------------------------|-----------|
| Operating Humidity Range            | Up to 93% RH, non-condensing @ 90° F (32° C) maximum |           |                                  |           |
| Installation Instructions Reference | Flex Amplifiers                                      | 579-173AC | Constant Supervision NAC Modules | 579-515AC |
|                                     | Digital/Analog Amplifiers                            | 579-174AC | Firefighter Phones               | 579-226AC |

### Additional 4100ES Data Sheet Reference

| Subject                    | Data Sheet  |
|----------------------------|-------------|
| Basic Panel with EPS/EPS+  | AC4100-0100 |
| Enclosures                 | AC4100-0037 |
| MINIPLEX Transponders      | AC4100-0103 |
| Speakers                   | AC4902-0003 |
| Network Display Unit (NDU) | AC4100-0102 |
| LED/Switch Modules         | AC4100-0032 |
| S/V, Addressable Strobe    | AC4906-0006 |
| S/V, SmartSync Strobe      | AC4906-0003 |
| Remote Firefighter Phones  | AC2084-0001 |
| Mic. Multiplex Module      | AC4100-0053 |
| Remote Battery Charger     | AC4081-0002 |
| Remote Annunciators        | AC4100-0038 |

