Simplex

4100ES Fire Control Panels

UL, ULC, CSFM Listed; FM Approved;
*MEA (NYC) Acceptance**

Addressable Fire Detection and Control
Emergency Voice/Alarm Communications Equipment

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:

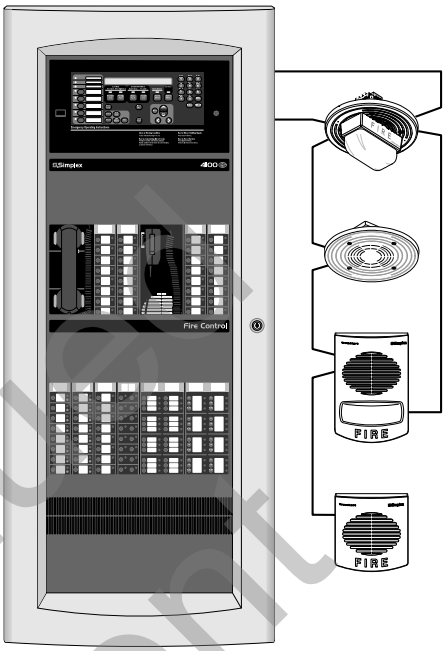
- Up to five supervised remote microphone inputs
- Spoken voice coding from the digital message player
- Multiple digitally recorded human voice messages
- Spoken WALKTEST system testing
- Separate evacuation, drill, and optional "All Clear" voice messages and tones
- Ready-to-talk microphone indicator 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



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 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.

4100U Series Products Note. The audio system modules and features listed in this data sheet are both compatible with, and listed for use with 4100U series fire alarm control panels. Contact your local Simplex® product supplier for details.

* See page 5 for product that is listed as UL or ULC and additional product listing details. This product has been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7165-0026:251 for allowable values and/or conditions concerning material presented in this document. Accepted for use – City of New York Department of Buildings – MEA35-93E. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products.

This is a continuation document.

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Audio Controller Module Description

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

Model	Description	
4100-8804	Select when **Custom Messages are required,** choose message types from below as required (minimum quantity of one)	
4100-0822	**Custom Messages from Tape**	Order (1) 4100-082x for each (2) complete messages without spliced phrases; **or** for each (50) spliced phrases
4100-0823	**Custom Messages from Transcript; NOTE:** Send transcript in advance to Applications Engineering to verify phrase quantity	
4100-0824	**Custom Messages from Archive**	
	CO Relocation Message; Temporal 4 Pattern horn tone with English male voice instruction; identify as "UCSET1393" when ordering	

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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 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 (see page 7 for mounting reference)

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
- Redundant amplifier operation can be configured as one-for-one or one-for-many depending on specific requirements
- Digital models of these amplifiers have a digital decoder module that selects the desired input channel per system requirements
- Selectable reduced output levels of -12 dB or -6 dB are available for non-emergency audio output

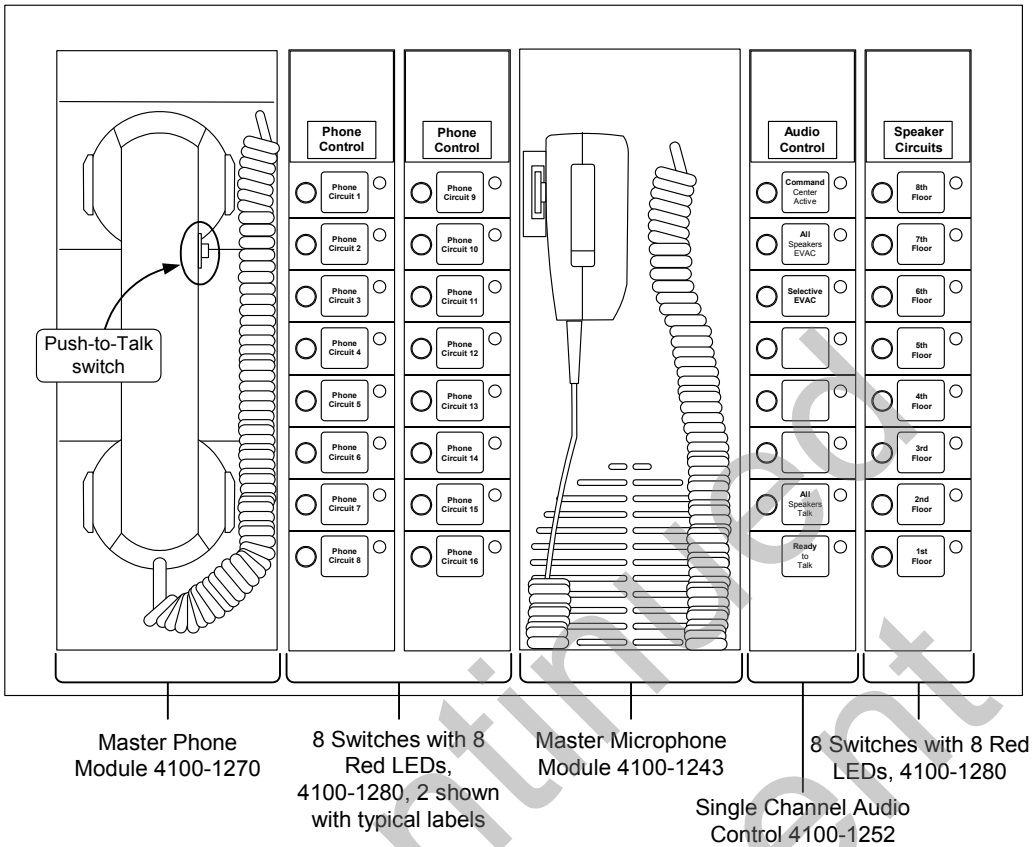
Audio NAC Expansion Modules

- For applications requiring additional NACs, modules are available for on-board expansion and further expansion is available with the chassis mounted 4100-5116 Expansion Signal Module
- 100 W Amplifiers support optional modules that convert the six audio NACs to Class A or to increase the Class B audio NACs to twelve
- **NOTE:** Adding NAC expansion modules does not increase amplifier power beyond the stated ratings

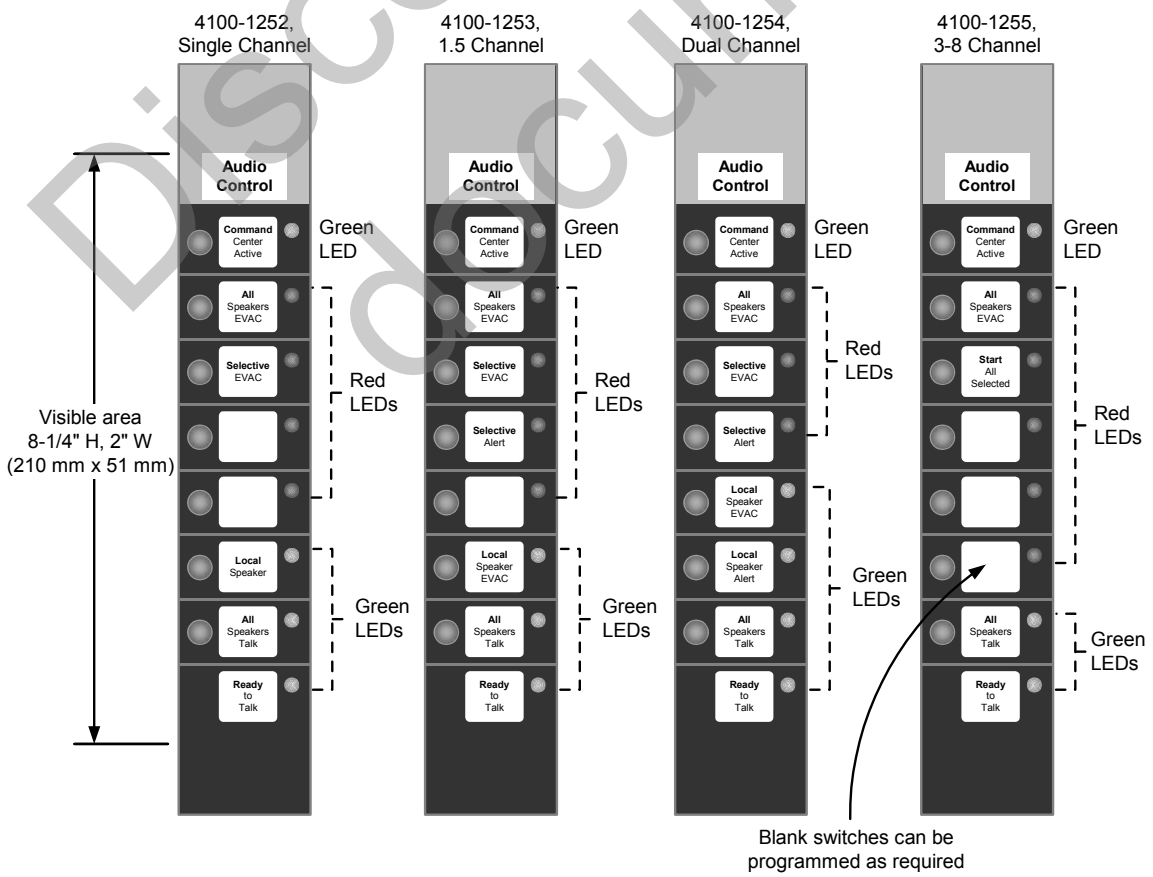
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Audio Bay Reference with Single Channel Audio Control and Firefighter Telephone Modules



Audio Control Modules



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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.

Analog Emergency Voice/Alarm Communications Equipment, Constant Supervision Compatible

Model	Description		Details		
4100-9620	Basic Analog Audio Operation with microphone, requires dedicated expansion bay		Includes: Expansion Bay, 4100-1210 Analog Controller Board, Microphone Module, and Audio Expansion Bay Kit		
4100-1210	Analog Controller Board only; order expansion bay and audio expansion bay kit separately		Controller board mounts in Blocks A and B		
4100-1361	25 VRMS output	Flex-35, 35 W Amplifier, constant supervision compatible	NAC rating = 1.4 A	35 W, or 100 speakers max.	Includes three on-board Class B audio NACs; power is supplied from an XPS, RPS, or SPS*
4100-1362	70.07 VRMS output		NAC rating = 0.5 A		
4100-1312	25 VRMS output	Flex-50, 50 W Amplifier, constant supervision compatible	NAC rating = 2 A	50 W, or 100 speakers max.	
4100-1313	70.7 VRMS output		NAC rating = 0.707 A		

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

Model/Output Voltage		Power Supply Input/Listing		Description	Details	
25 VRMS	70.7 VRMS					
4100-1314	4100-1315	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)	ULC models have low battery dropout circuit
4100-1316	4100-1317	120 VAC, 60 Hz	ULC			
4100-1318	4100-1319	220/230/240 VAC, 50/60 Hz	UL			
4100-1320	4100-1321	120 VAC, 60 Hz	UL	Backup 100 W Amplifier	Uses the six Class B NACs of primary amplifier	
4100-1322	4100-1323	120 VAC, 60 Hz	ULC			
4100-1324	4100-1325	220/230/240 VAC, 50/60 Hz	UL			

Digital Emergency Voice/Alarm Communications Equipment, Constant Supervision Compatible

Model	Description		Details		
4100-9621	Basic Digital Audio Operation with microphone, requires dedicated expansion bay		Includes: Expansion Bay, 4100-1311 Digital Controller Board, Microphone Module, and Audio Expansion Bay Kit		
4100-1311	Eight Channel Digital Controller Board only; order expansion bay and audio expansion bay kit separately		Controller board mounts in Blocks A and B		
4100-1363	25 VRMS output	Flex-35, 35 W Amplifier, constant supervision compatible	NAC rating = 1.4 A	35 W, or 100 speakers max.	Includes three on-board Class B audio NACs; power is supplied from an XPS, RPS, or SPS*
4100-1364	70.07 VRMS output		NAC rating = 0.5 A		
4100-1326	25 VRMS output	Flex-50, 50 W Amplifier, constant supervision compatible	NAC rating = 2 A	50 W, or 100 speakers max.	
4100-1327	70.7 VRMS output		NAC rating = 0.707 A		

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

Model/Output Voltage		Power Supply Input/Listing		Description	Details	
25 VRMS	70.7 VRMS					
4100-1328	4100-1329	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)	ULC models have low battery dropout circuit
4100-1330	4100-1331	120 VAC, 60 Hz	ULC			
4100-1332	4100-1333	220/230/240 VAC, 50/60 Hz	UL			
4100-1334	4100-1335	120 VAC, 60 Hz	UL	Backup 100 W Amplifier	Uses the six Class B NACs of primary amplifier	
4100-1336	4100-1337	120 VAC, 60 Hz	ULC			
4100-1338	4100-1339	220/230/240 VAC, 50/60 Hz	UL			

Audio Options for use with *either* Analog or Digital Systems (see page 2 for custom message ordering)

Amplifier and Related Audio Options

Model	Description		Details and Mounting Reference		
4100-1245	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; *Supv. = 8.4 mA, Alarm = 60 mA*		
4100-1246	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; *Supv. = 1 mA, Alarm = 30 mA*		
4100-1248	100 W 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; *Supv. = 17 mA, Alarm = 60 mA*		
4100-1249	100 W 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; *Supv. = 1 mA, Alarm = 60 mA*		
4100-1259	25 VRMS 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)	*Supv. = 10 mA on batteries; Alarm = 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;	
4100-1260	70.7 VRMS Output; NAC rating = 0.707 A, 50 W, or 100 speakers maximum		*Supv. = 38 mA Alarm = 70 mA*		

* Refer to data sheet S4100-0031 for power supply details.

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Emergency Voice/Alarm Communications Equipment Product Selection *(Continued)*

Amplifier and Related Audio Options *(Continued)*

Model	Description	Details and Mounting Reference	
4100-5116	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; *Supv. = 20 mA; Alarm = 80 mA*	
4100-1266	Expansion Signal Module NAC Expander; NAC rating = 1.5 A, 50 W, or 100 speakers maximum	Expands module capacity to six, Class B NACs; *Supv. = 0.84 mA; Alarm = 60 mA*	These modules mount on the 4100-5116; select one max. per 4100-5116 as required
4100-1267	Expansion Signal Module Class A Adapter; NAC rating = 1.5 A, 50 W, or 100 speakers maximum	Converts 3 Class B, NACs to Class A; *Supv. = 1 mA; Alarm = 30 mA*	
4100-1268	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; *Supv. = 38 mA on batteries (constant supervision deactivated); Alarm = 70 mA*	
4081-9018	End-of-line resistor harness for 70.7 VRMS NACs; 10 kΩ, 1 W		
4100-2300	Expansion Bay Hardware; **order one for each expansion bay**		
4100-2320	Audio Bay-to-Bay Interconnection Harness Kit; **order one for each audio bay addition**		
4100-0637	Audio Box Interconnection Harness Kit; **order one for each close-nippled audio cabinet**		

Audio Input and Controller Options (see page 2 for custom message ordering)

Model	Description	Details and Mounting Reference	
4100-1240	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; *current = 10 mA*	
4100-1241	8 Minute Message Expansion Module	Provides 8 minutes at normal resolution or 4 minutes at high resolution, *Supv. = 2 mA; Active = 17 mA*	Mounts to audio controller module
4100-1242	32 Minute Message Expansion Module	Provides 32 minutes at normal resolution or 16 minutes at high resolution; *Supv. = 2 mA; Active = 17 mA*	

Operator Interface and Related Options

Model	Description	Details and Mounting Reference	
4100-1243	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*
4100-1244	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)	
4003-9803	Remote Microphone Module	Mounted on plate with controls, for 2-gang box mount, see data sheet S4100-0053 for details	
4100-1252	1 Channel (audio or mike)	Operator Interface LED/Switch Modules	Single Slot LED/switch modules; connects to a 4100-1288 or 4100-1289 LED/switch controller in the same bay; space behind controller accepts 4100ES flat modules only (see drawings on p. 4); *current = 24 mA*; Additional adjacent LED/switch modules, as shown on p. 4, are used as required for specific speaker circuit selection (refer to data sheet S4100-0032 for LED/switch module availability)
4100-1253	1.5 Channel (audio + mike)		
4100-1254	2 Channel (full audio)		
4100-1255	3-8 Channel (8 channel normal res. messages, 4 channels of high res. messages)		
4100-1288	64 LED/64 Switch Controller Module with mounting plate	Refer to data sheet S4100-0032 for details	Mounts behind the LED/switch modules; has provisions for one 4100-1289 Controller Module
4100-1289	64 LED/64 Switch Controller Module without mounting plate		Mounts on extra space of 4100-1288; controls additional 64 LEDs and 64 switches

LED/switch controllers and their connected modules must be in the same bay

Firefighter Telephone System Products

Model	Description	Details and Mounting Reference
4100-1270	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 4100-1272 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; *Supv. = 80 mA; in use = 140 mA + remote phones (see table on page 7)*
4100-1271	Remote Master Telephone	Mounts in Remote Annunciator Panel only (see S4100-0038)
4100-1272	Expansion Telephone Control Module with three Class B telephone NACs	Expansion module for additional telephone circuits in main control or transponders; *Supv. = 80 mA; in use = 140 mA + remote phones*
4100-1273	Telephone NAC Class A Adapter Module	Mounts to 4100-1270 or -1272; no additional current required

Network and MINIPLEX Transponder Audio Connection Options

Model	Description		Details
4100-0623	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; *current = 14 mA*
4100-0621	Dual Channel *Analog* Audio Riser Module	Select one, mounts in Block B	Accepts two separate audio signals from host; controlled by Transponder Interface Module; *current = 25 mA when active*
4100-0622	3-8 Channel *Digital* Audio Riser Module; with NAA input		Receives and decodes digital inputs; up to eight audio channels; *current = 70 mA;* NAA input for 25, 70.7, or 0.707 VRMS
4100-1341	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/ 4100U/4100 Legacy voice panel; *current = 70 mA*
4100-9854	4100/4100+ Legacy bay mounting kit		Use to mount 4100-1341 MCC Digital Audio Riser Interface in legacy panel
4100-1258	NPU to 4100ES Audio Interconnect Module; mounts in 4100ES Audio cabinet		Dual terminal block module with harnesses for connecting to the Audio Controller and Telephone Control module (requires 1 Block)

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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.

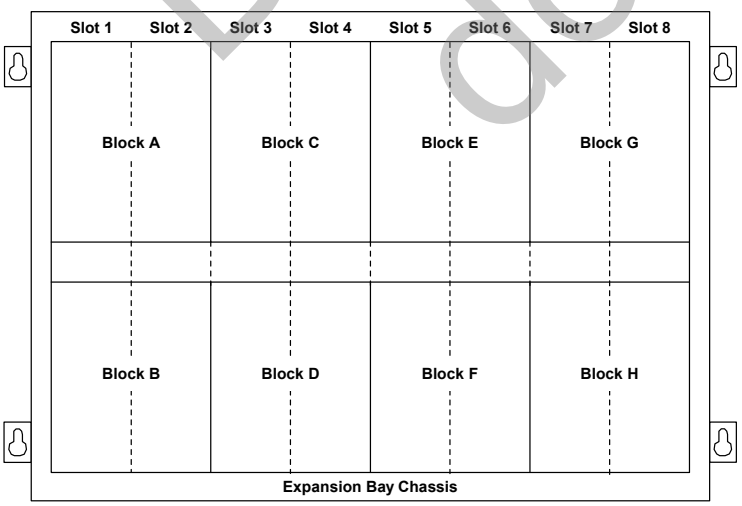
Telephone riser operation can be programmed to provide a telephone riser output that is used to interconnect telephone interface modules in different locations. This output type has ring and hold tones disabled.

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.

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

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; 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

* **NOTE:** When mounting dual Flex amplifiers on an expansion bay, special mounting rules apply.

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General Specifications

Input Power

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

Amplifier Ratings

Built-in Tones	500 Hz horn tone operated at temporal pattern, provided when amplifiers are separated from audio controller		
Flex-35 Amplifiers: 4100-1361 4100-1362 4100-1363 4100-1364	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: 4100-1312 4100-1313 4100-1326 4100-1327	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: *4100-1314, 4100-1316, 4100-1318, 4100-1320, 4100-1322, 4100-1324*; **4100-1328, 4100-1330, 4100-1332, 4100-1334, 4100-1336, 4100-1338**	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		

Audio Controller Ratings

Current Requirements	4100-9620, 4100-1210	Analog = 225 mA supervisory	Add for local speaker in alarm: *75 mA min. volume; 190 mA half volume; 333 mA full volume*; Add microphone current separately; *Supv.= 2.4 mA; Active = 30 mA*
	4100-9621, 4100-1311	Digital = 85 mA supervisory	
Analog Riser Distance	Up to 10,000 ft (3048m) total with 18 AWG (0.82 mm^2) shielded twisted pair (STP)		
Digital Riser Distance; 18 AWG unshielded, twisted pair (UTP) required, except as noted (refer to Installation Instructions 574-844)*	Up to 2500 ft (762 m) from 4100-1311 Digital Controller to 4100-0622 Digital Audio Riser or 4100-1341 MCC Digital Riser Interface; up to 2500 ft (762 m) between 4100-0622 Digital Audio Riser Modules or 4100-1341 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)**		

Firefighter Telephone Distance Ratings

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

Battery Charger, System and Remote Power Supply (sealed lead-acid batteries)

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

Environmental and Installation Instruction Reference

Operating Temperature Range	32° to 120°F (0° to 49° C)			
Operating Humidity Range	Up to 93% RH, non-condensing @ 90° F (32° C) maximum			
Installation Instructions Reference	Flex Amplifiers	579-173	Constant Supervision NAC Modules	579-515
	Digital/Analog Amplifiers	579-174	Firefighter Phones	579-226

Additional 4100ES Product Reference

Subject	Data Sheet	Subject	Data Sheet	Subject	Data Sheet
Battery and Battery Cabinet Reference for 4100ES	S2081-0006	NDU with SPS Power Supplies for 4120 Network	S4100-0036	4100ES Basic Panels with EPS Power Supplies	S4100-0100
110 Ah Batteries and Cabinets for 4100ES	S2081-0012	4100ES Remote Annunciator Panels	S4100-0038	InfoAlarm Command Center with EPS Power Supplies	S4100-0101
Seismic Battery Brackets Reference	S2081-0019	InfoAlarm Command Center with SPS Power Supplies	S4100-0045	NDU with EPS Power Supplies for 4120 Network	S4100-0102
4100ES Basic Panels with SPS Power Supplies	S4100-0031	NDU with SPS Power Supplies for ES Net	S4100-0077	NDU with EPS Power Supplies for ES Net	S4100-0104

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