

TSA Portland International Jetport
Portland, ME

Fire Alarm System
Equipment Submittal
05/03/13



20 Thomas Drive
Westbrook, ME 04092-3824

**Project: Portland International Jetport
Secure Exit Portal & Associated Renovations
1001 Westbrook St.
Portland, ME 04102**

**Customer: Efficiency Electric
356 Windham Center Road
Windham, ME 04062**

Date: 5/3/13

Sales Representative: Sam Martin

**FIRE ALARM SYSTEM
EQUIPMENT SUBMITTAL**

Please contact the SimplexGrinnell Service Department **TWO WEEKS IN ADVANCE** to schedule a technician for checkout.

SimplexGrinnell District Contact Information:

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SimplexGrinnell
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Westbrook, ME 04092

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Submittal Approval:

Approved By: _____

Date: _____

TSA PORTLAND JETPORT FIRE ALARM SYSTEM EQUIPMENT DATA SUBMITTAL

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Simplex Addressable Speaker/Visible Notification Appliances Data Sheet (S4906-0006)

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INSERT 1

PROJECT BILL OF MATERIAL

**BILL OF MATERIAL
TSA PORTLAND INTERNATIONAL JETPORT
FIRE ALARM SYSTEM EQUIPMENT**

TAB	QTY	MODEL	DESCRIPTION
TRANSPONDER CONTROL PANEL, BATTERIES & ACCESSORIES			
2	1	4100-9600	BASIC TRANSPONDER
2	1	4100-5111	SYSTEM POWER SUPPLY (SPS) - 120VAC 60HZ
2	1	4100-1329	DIGITAL 100W AMP,6NAC,120VAC,70V
2	1	4100-5120	TRUEALERT POWER SUPPLY, 3 CHANNELS, 120V
2	1	4100-0622	DIGITAL AUDIO RISER MODULE
2	1	4100-0632	UTILITY BLOC, 16 TERMINALS
2	1	4100-3206	8 RELAYS - 3 AMP
2	1	4100-0634	POWER DISTRIBUTION MODULE 120V
2	1	4100-2300	EXPANSION BAY (PHASE 10 ONLY)
2	1	4100-2303	EXPANSION BAY STABILIZER BRACKET
2	2	4100-2300	EXPANSION BAY (PHASE 10 ONLY)
2	1	4100-2163	INDICATOR ONLY 3 BAY SOLID DOOR
2	1	2975-9449	3 BAY BACK BOX, SOLID DOOR RED
2	2	2081-9275	BATTERY, SYSTEM, 12VOLT, SEALED, LEAD ACID 18Ah
INITIATING/ADDRESSABLE DEVICES & ACCESSORIES			
3	1	4098-9714	TRUEALARM PHOTO SMOKE SENSOR
3	1	4098-9792	TRUEALARM SENSOR BASE
NOTIFICATION APPLIANCES & ACCESSORIES			
4	2	4906-9201	MC TRUEALERT V/O ADDRESSABLE, WALL MT RED
4	13	4906-9251	MC TRUEALERT S/V ADDRESSABLE, WALL MT RED
4	3	4902-9716	SPEAKER, RED

INSERT 2

TRANSPONDER CONTROL PANEL, BATTERIES & ACCESSORIES

Features

4100ES Series MINIPLEX transponders allow remotely located initiating and notification functions:

- Transponder operation is available as standard or with local mode operation
- Communications with the host fire alarm control panel use the Remote Unit Interface (RUI) format

Initiating functions include:

- Conventional initiating device circuit (IDC) support
- Addressable device support including TrueAlarm® analog sensor compatibility**

Notification functions include:

- Conventional DC notification appliance circuits
- Emergency voice/alarm communications
- TrueAlert® addressable strobe and horn notification

Local mode operation provides:

- Default local initiating and notification operation in the event of a communications loss with the host control panel
- Enabling of an optional Local Mode Controller with a local alarm sounder, LED status indicators, and keyswitch enabled control switches
- Support for IDNet™ addressable devices, conventional and TrueAlert addressable notification appliances, and default output tones from local amplifiers**

Optional modules include:

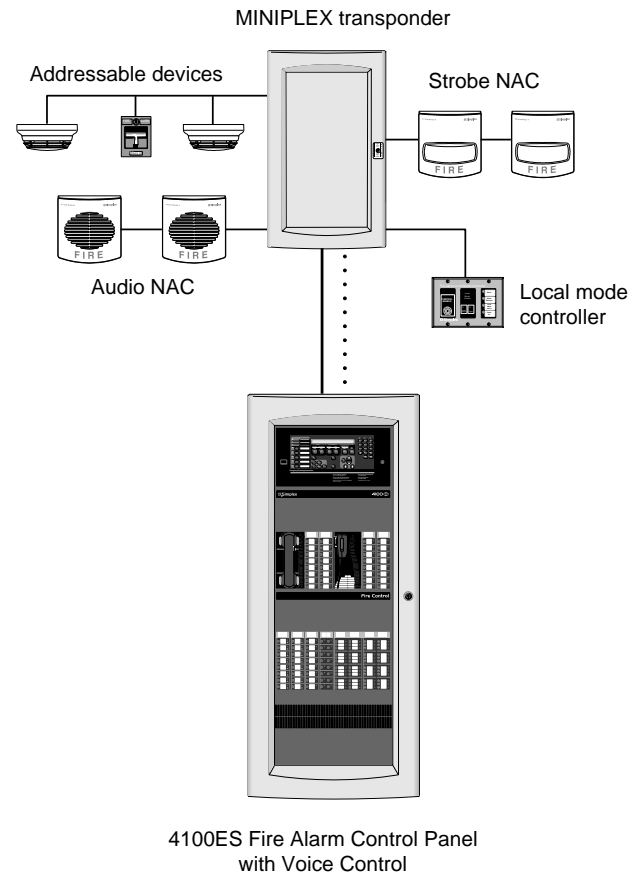
- Digital or Analog audio riser modules for connection to system audio signals
- Digital or analog input audio amplifiers with integral on-board NACs
- Power supplies with or without battery chargers
- City Connect modules and RS-232 ports for printers or maintenance terminals
- Alarm relays, auxiliary relays, additional IDC modules, and NAC expansion modules

Cabinets are equipped with solid doors (beige or red) and in one, two, or three bay sizes

Listed to:

- UL Std. 864, Fire Detection and Control (UOJZ), and Smoke Control Service (UUKL)
- UL Std. 2017, Process Management Equipment (QVAX)
- UL Std. 1076, Proprietary Alarm Units-Burglar (APOU)
- UL Std. 1730, Smoke Detector Monitor (UULH)
- ULC Std. S527-99

* See pages 4 and 5 for product that is listed as UL or ULC. 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. It is subject to re-examination, revision, and possible cancellation. 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 Safety Products Westminster.



Typical 4100ES MINIPLEX System One-Line Drawing

Introduction

4100ES MINIPLEX transponders connect to a host 4100ES Fire Alarm Control Panel using Simplex® remote unit interface (RUI) communications. At the transponder, RUI communications are received by the transponder interface module and translated into the same internal communications format that is used in the host control panel.

Remotely located modules. With RUI communications, the transponder can remotely provide the same initiating and notification functions that occur at the host control panel without requiring multiple long distance wiring runs. Connections to the host panel are low current communications and audio wiring with distances up to 2500 ft (762 m).

4100U Series Products Note. The 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.

** Simplex fire alarm technology is protected by the following U.S. Patent Numbers: TrueAlarm analog smoke detection: 5,155,468; 5,173,683 and 5,543,777. IDNet and MAPNET II addressable communications: 4,796,025. TrueAlert addressable notification: 6,313,744 and 6,426,697. SmartSync horn/strobe control: 6,281,789. Flex-35 and Flex-50 amplifier operation: 6,452,491.

Introduction (Continued)

Please refer to document S4100-0031 and the other documents listed on page 3 for additional information concerning the extensive initiating and notification features of the 4100ES fire alarm control panels.

Module Bay Description

Transponder model 4100-9600 includes a bay assembly, a power distribution interface module (PDI), a Basic Transponder Interface Module, and an interconnect harness. Communications with the host fire alarm control panel are via a Remote Unit Interface (RUI) connection that allows for up to 2500 ft (762 m) distance. RUI can communicate with up to a total of 31 remote devices and can be either Style 4 or Style 7 communications.

Transponder model 4100-9601 substitutes a Local Mode Transponder Module for the Basic Transponder Module.

Optional Expansion Bays each include a PDI and accept a variety of optional modules (refer to list starting on page 4).

The Battery Compartment (bottom) accepts two batteries, up to 50 Ah, that can be mounted within the cabinet. Battery mounting does not interfere with available module space. A power supply with battery charger is required for each battery set.

Packaging Availability

- Modules are power-limited (except as noted, such as relay modules)
- Enclosure are available for one, two, or three bay sizes or for cabinet rack mounting
- Boxes and solid doors are available in beige or red (ordered separately)
- Up to eight close-nipped cabinets can be connected at one transponder location (close-nipped is mounted within 20 ft (6 m) and with interconnecting wiring enclosed in conduit)
- Refer to document S4100-0037 for enclosure details

Local Mode Control Operation

Default Stand-Alone Operation. In the event of a communications loss with the host fire alarm control panel, model 4100-9601 MINIPLEX Local Mode Transponders provide fire alarm response default operation for its connected devices and appliances per the following.

Input Operation. During local mode operation, TrueAlarm initiating devices connected to the transponder will cause an alarm at their least sensitive alarm threshold.

- Photoelectric sensors will alarm at 3.7%/ft smoke obscuration
- Ionization sensors will alarm at 1.3%/ft obscuration
- Heat sensors will alarm at a fixed temperature of 135° F (57° C)
- TrueAlarm device LEDs will be activated to indicate a device in alarm

Local Mode Control Operation (Continued)

Notification Operation. Fire alarm conditions reported against a fire alarm point type within a transponder in local mode will cause all notification appliance circuits in that transponder to:

- Sound a general alarm temporal pattern horn tone
- Activate visible notification appliance circuits

Local Mode Module Support. Local mode operation provides support for the following 4100ES modules:

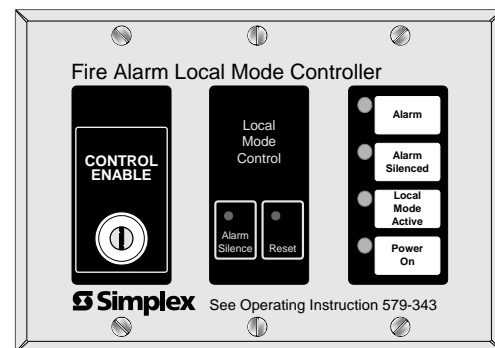
- System Power Supplies (SPS), Expansion Power Supplies (XPS), and Remote Power Supplies (RPS), including on-board notification appliance circuits (NACs) and expansion signal modules, operated at a temporal pattern,
- TrueAlert Power Supplies (TPS) including the on-board signaling line circuits (SLCs)
- IDNet addressable device circuits, including those on-board the SPS, IDNet expansion modules, and the quad isolator when used for IDNet communications
- 4100ES amplifiers will provide their on-board horn tones (500 Hz) at a temporal pattern through their on-board amplifier NACs

Local Mode Operation Module Exclusion. Modules not listed above but that are listed as compatible with MINIPLEX transponders per this document, do not interfere with local mode operation but **are not supported** during local mode operation.

Local Mode Controller

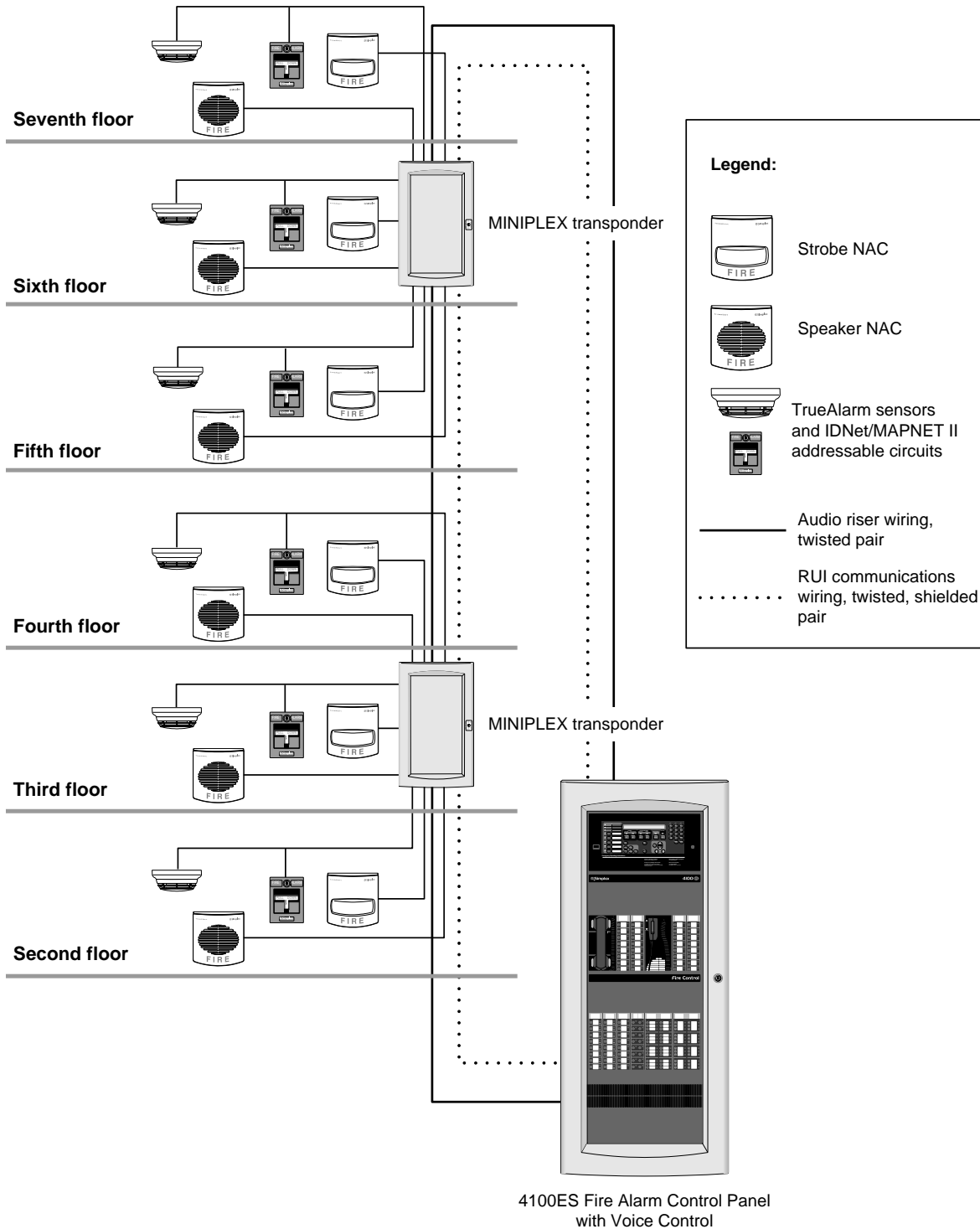
Operation. During local mode operation, an optional Local Mode Controller will indicate status (see illustration below) and can be enabled using a keyswitch to perform local alarm silence or reset. If alarms occurring during local mode are reset using a Local Mode Controller, upon restoration of communications, **those alarms will not be sent to the master controller.** If alarms are still present upon restoration of communications, then the alarm condition will be reported and host fire alarm control panel programmed alarm functions will occur. When communications are re-established, the local mode transponder restores automatically.

Mounting. Local Mode Controllers are mounted on three-gang plates, are available in beige or red, and for either flush or semi-flush mounting. (See page 7 for details).



Local Mode Controller Module

Typical Multi-Floor MINIPLEX Audio System



First floor

Additional 4100ES Data Sheet Reference

Subject	Data Sheet	Subject	Data Sheet
Enclosures	S4100-0037	Basic Panel Modules and Accessories	S4100-0031
LED/Switch Modules	S4100-0032	Network Display Unit (NDU)	S4100-0036
4100ES Audio/Phone Modules	S4100-0034	Remote Annunciators	S4100-0038
TrueAlert Addressable Products	S4009-0003	Remote Battery Charger	S4081-0002
IDNet+ Module with Quad Isolator	S4100-0046	Addressable Device Compatibility	S4090-0011

MINIPLEX Transponder Product Selection

Transponder Type

Model	Description	Supv.	Alarm
4100-9600	Basic Transponder, includes bay equipment with power distribution interface, and 4100-0620 Basic Transponder Interface Module mounted in Block A	87 mA	87 mA
4100-9601	Local Mode Transponder, includes bay equipment with power distribution interface, and 4100-0625 Local Mode Transponder Interface Module mounted in Block A	normal	87 mA
		in local mode	112 mA

Local Mode Controller Selection

Model	Description	Supv.	Alarm
4601-9108	Flush mount	normal	12 mA
4601-9109	Surface mount		
4601-9110	Flush mount	in local mode	20 mA
4601-9111	Surface mount		

Red with white lettering
Local Mode Controller, 3-gang plate mounted; flush mount requires a 1-1/2" (38 mm) deep 3-gang box; surface mount controllers include a matching mounting box; see p. 7 for details

Beige with black lettering

Communication Modules

Model	Description	Size	Supv.	Alarm			
4100-6031	Select one per SPS	City Circuit, with disconnect switches	For use with SPS only, not RPS	Mounts on SPS or RPS	20 mA	36 mA	
4100-6032					City Circuit, without disconnect switches	20 mA	36 mA
4100-6033					Alarm Relay, 3 Form C relays, 2 A @ 32 VDC; for SPS or RPS	15 mA	37 mA
4100-6038	Dual RS-232 Interface	1 Slot	132 mA	132 mA			
4100-6045	Decoder Module	3 Slots	85 mA	163 mA			
4100-6048	VESDA® Aspiration System Interface	1 Slot	132 mA	132 mA			
4100-9816	Master Clock Interface Module with one standard RS-232 port (see S4100-0033)	1 Slot	132 mA	132 mA			

Expansion, System, Remote, and TrueAlert Power Supplies and Accessories (XPS, SPS, and RPS are rated 9 A for "Special Application" appliances, 3 A/NAC; and 5 A for "Regulated 24 DC" power, 2 A/NAC; TPS is rated per below)

Model	Voltage/Listing	Description	Size	Supv.	Alarm
4100-5101	120 VAC	Expansion Power Supply (XPS); 9 A output; 3 Class A/B NACs; Canadian models have low battery cutout*	2 Blocks	50 mA	50 mA
4100-5103	120 VAC, Canadian				
4100-5102	220-240 VAC				
4100-5115	NAC Expansion Module, 3 NACs, Class A/B, mounts on XPS only		N.A.	25 mA	25 mA
4100-5111	120 VAC	System Power Supply (SPS); 9 A power supply/charger with 250 point IDNet channel; 3 Class A/B NACs; expansion slot for City Circuit or Alarm Relay option; Canadian model has low battery cutout*	4 Blocks	175 mA	185 mA
4100-5112	120 VAC, Canadian				
4100-5113	220-240 VAC				
4100-5125	120 VAC	Remote Power Supply (RPS); 9 A power supply/charger similar to SPS except no IDNet channel or City Circuits; will accept one 4100-6033; Canadian model has low battery cutout*	4 Blocks	150 mA	185 mA
4100-5126	120 VAC, Canadian				
4100-5127	220-240 VAC				
4100-5120	120 VAC	TrueAlert Power Supply (TPS); 3, 3 A Class B SLCs for up to 63 TrueAlert addressable (special application) appliances per SLC, 189 per TPS; built-in battery charger; 2 A aux. power output; Canadian model has low battery cutout	4 Blocks	88 mA	100 mA
4100-5121	120 VAC, Canadian				
4100-5122	220-240 VAC				
4100-5124	TrueAlert SLC Class A Adapter for all 3 SLCs, mounts on TPS only		N.A.	10 mA	10 mA
4100-5152	12 VDC Power Option, 2 A maximum		1 Block	1.5 A maximum	
4100-0636	Box Interconnection Harness Kit (non-audio); order one for each close-nipped cabinet				

Special Application Appliances Simplex 4901, 4903, 4904, and 4906 Series horns, strobes, and combination horn/strobes and speaker/strobes (contact your Simplex product representative for compatible appliances)

Regulated 24 DC Appliances Power for other UL listed appliances; use associated external synchronization modules where required

Miscellaneous Options and Accessories

Model	Description
4100-1290	24 Point I/O Module for external connections, select each point as either a switch input (momentary or maintained) or an output (for lamp/LED/relay); requires 1 Slot (refer to data sheet S4100-0032 for additional information)
4100-0632	Terminal Block Utility Module with 2, 16 position terminal blocks on 4" x 5" single block, for of up to 12 AWG wire (3.31 mm ²)
4100-0633	Door Tamper Switch, connects into Transponder Interface Module, one per cabinet assembly if required
4100-0634	Power Distribution Module (PDM) select per system voltage; one required per box
4100-0635	
4100-9837	Green LED Power-on Indicator Kit, required for ULC listing of MINIPLEX transponder ; mounts on solid door knockout
2081-9031	Series resistor for WSO, IDCs (N.O. water flow and tamper on same circuit, wires after water flow and before tamper) 470 Ω, 1 W, encapsulated, two 18 AWG leads (0.82 mm ²), 2-1/2" L x 1-3/8" W x 1" H (64 mm x 35 mm x 25 mm)

* Standard power supply NACs can provide synchronized strobe or SmartSync™, two-wire operation.

Continued on next page

MINIPLEX Transponder Product Selection (Continued)

Audio Riser Modules

Model	Description	Size	Supv.	Alarm
4100-0621	Dual Channel <i>Analog</i> Audio Riser Module; accepts one or two separate audio signals from host control panel; mounts in Block B, is controlled by Transponder Interface Module	1 Block	0 mA	15 mA
4100-0622	3-8 Channel <i>Digital</i> Audio Riser Module; similar to analog module, except receives and decodes a digital input signal with up to eight audio channels; with Non-Alarm Audio input	1 Block	70 mA	70 mA

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

Model	Description	Details
4100-1361	25 VRMS output	Includes three on-board Class B audio NACs; power is supplied from an XPS, RPS, or SPS
4100-1362	70.07 VRMS output	
4100-1312	25 VRMS output	Flex-50, 50 W Amplifier, constant supervision compatible
4100-1313	70.7 VRMS output	

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 = 50 W or 100 speakers maximum; 2 A @ 25 VRMS; 1.4 A @ 70.7 VRMS
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*

Model	Description	Details
4100-1363	25 VRMS output	Includes three on-board Class B audio NACs; power is supplied from an XPS, RPS, or SPS
4100-1364	70.07 VRMS output	
4100-1326	25 VRMS output	Flex-50, 50 W Amplifier, constant supervision compatible
4100-1327	70.7 VRMS output	

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 = 50 W or 100 speakers maximum; 2 A @ 25 VRMS; 1.4 A @ 70.7 VRMS
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		

Options for use with either Analog or Digital Amplifiers

Model	Description	Details and Mounting Reference
4100-1245	Flex-35/50 Expansion NAC Module; adds three Class B audio NACs	Mounts on Flex-35/50 assembly; NAC ratings = 1.5 A, 35/50 W, or 100 speakers maximum; <i>Supv</i> = 8 mA, <i>Alarm</i> = 60 mA
4100-1246	Flex-35/50 Class A Adapter Module; converts three on-board NACS to Class A operation	
4100-1248	100 W Amplifier Expansion NAC Module; NAC ratings = 1.5 A, 50 W, or 100 speakers max.	Provides six additional Class B audio NACs, mounts on 100 W amplifier assembly; <i>Supv</i> = 17 mA, <i>Alarm</i> = 60 mA
4100-1249	100 W Class A Adapter Module; NAC ratings = 2 A, 50 W, or 100 speakers max.	
4100-1259	25 VRMS Output; NAC rating = 2 A, 50 W, or 100 speakers max.	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 max.	

Firefighters Telephone Options

Model	Description	Size	Supv.	In Use
4100-1272	Expansion Telephone Control Module with three Class B telephone NACS; required when telephone circuits are mounted in transponder;	1 Block	80 mA	130 mA
4100-1273	Telephone Class A Adapter Module; mounts on 4100-1272; no additional current required			

* Refer to document S4100-0034 for additional audio information.

Continued on next page

MINIPLEX Transponder Product Selection (Continued)

Audio Expansion Signal Module and Options

Model	Description	Details and Mounting Reference	
4100-5116	Expansion Signal Module; three, 1.5 A Class B NACs for Audio applications; 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 = 20 mA; Alarm = 80 mA</i>	
4100-1266	Expansion Signal Module NAC Expander; NAC rating = 1.5 A, 50 W, or 100 speakers max.	Expands module capacity to six, Class B NACs; <i>Supv = 0.84 mA; Alarm = 60 mA</i>	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; <i>Supv = 0 mA; Alarm = 30 mA</i>	
4100-1268	Expansion Signal Module Constant Supervision Adapter; Converts 3 Class B NACs to Constant Supervision Class B or Class A NACs; for 25 VRMS or 70.7 VRMS audio	NAC rating = 1.4 A, 50 W, or 100 speakers max.; <i>Supv = 38 mA on batteries (constant supervision deactivated); Alarm = 70 mA</i>	

General Audio Options

Model	Description
4081-9018	End-of-line resistor harness for 70.7 VRMS NACs; 10 k Ω , 1 W
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

Initiating Device Circuits (IDCs)

Model	Description	Size	Supv.	Alarm
4100-5005	Eight zones, Class B	1 Slot	75 mA	195 mA
4100-5015	Eight zones, Class A	1 Slot	75 mA	195 mA

Addressable Interface Modules

Model	Description	Size	Supv.	Alarm
4100-3101	IDNet Module, 250 point capacity	–	200 mA	250 mA
4100-3104	IDNet Module, 127 point capacity	–	102 mA	127 mA
4100-3105	IDNet Module, 64 point capacity	–	51 mA	64 mA

IDNet Modules, Specifications for each capacity; Module size = 1 Block

Model	Description	Size	Supv.	Alarm	
4100-3102	MAPNET II [®] Module, 127 point capacity, add devices separately; Module size = 2 Slots; Loading per MAPNET II device = 1.7 mA	Module without devices	–	75 mA	115 mA
		Loading per IDNet device	–	0.8 mA	1 mA
4100-3103	Isolator Module for MAPNET II or IDNet communications; converts one SLC into four isolated Class A or Class B outputs; up to two Modules can be connected to one SLC; NOTE: Compatible with MAPNET II Remote Isolators only; for quad isolation with IDNet Remote Isolators, use 4100-3107 IDNet+ Module (refer to data sheet S4100-0046 for details)	Module without devices	–	255 mA	275 mA
		Fully loaded module, total	–	471 mA	491 mA
4100-3103	Isolator Module for MAPNET II or IDNet communications; converts one SLC into four isolated Class A or Class B outputs; up to two Modules can be connected to one SLC; NOTE: Compatible with MAPNET II Remote Isolators only; for quad isolation with IDNet Remote Isolators, use 4100-3107 IDNet+ Module (refer to data sheet S4100-0046 for details)	1 Slot	50 mA	50 mA	

Relay Modules; Nonpower-Limited

Model	Description	Resistive Ratings		Inductive Ratings		Size	Supv.	Alarm
4100-3202	4 DPDT w/feedback	10 A	250 VAC	10 A	250 VAC	2 Slots	15 mA	175 mA
4100-3204	4 DPDT w/feedback	2 A	30 VDC/VAC	1/2 A	30 VDC/120 VAC	1 Block	15 mA	60 mA
4100-3206	8 SPDT	3 A	30 VDC/120 VAC	1-1/2 A	30 VDC/120 VAC	1 Block	15 mA	190 mA

Current Calculation Notes:

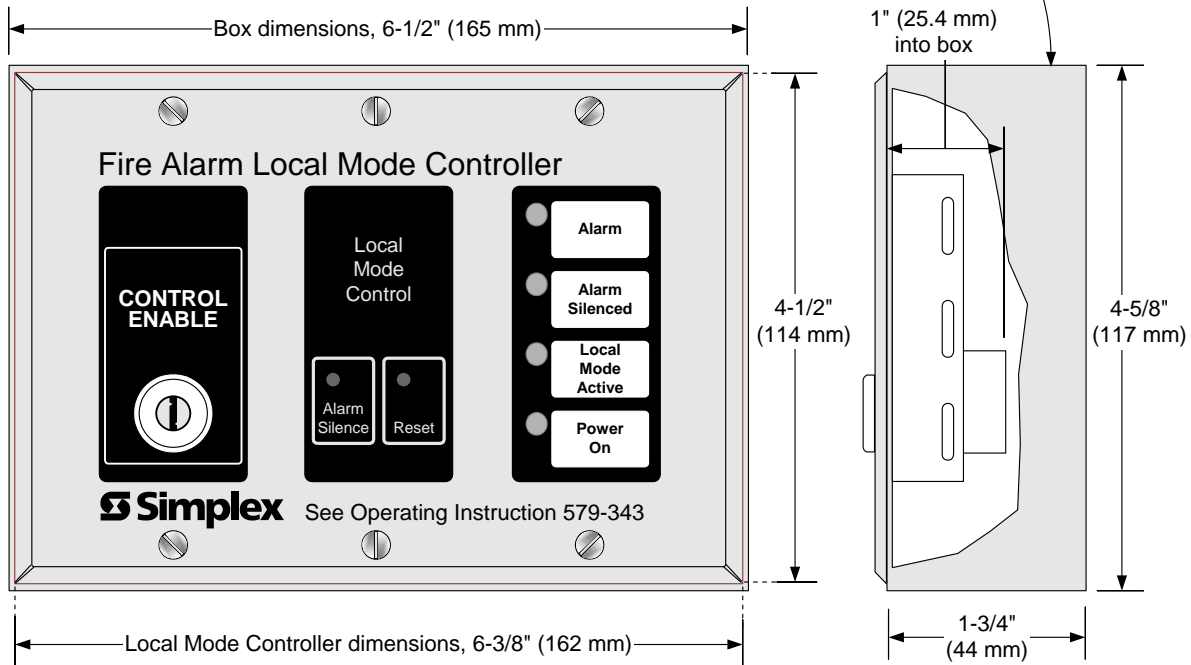
- For total supervisory current, add panel module currents to base system value **and** add all external loads panel-powered loads.
- For total alarm current, add panel module currents to base system alarm current **and** add all panel NAC loads **and** all external loads powered from panel power supplies.

General Specifications

Input Power [System (SPS); Expansion (XPS); Remote (RPS); TrueAlert Power Supplies (TPS); 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; separate taps for 220/230/240 VAC		
Power Supply Output Ratings for SPS, XPS, and RPS (nominal 28 VDC on AC; 24 VDC on battery backup)	Total Power Supply Output Rating	Including module currents and auxiliary power outputs; 9 A total for "Special Application" appliances; 4 A total for "Regulated 24 DC" power		Output switches to battery backup during mains AC failure or brownout conditions
	Auxiliary Power Tap	2 A maximum		
	NACs Programmed for Auxiliary Power	2 A maximum per NAC; 5 A maximum total	Rated 19.1 to 31.1 VDC	
Battery Charger Ratings for SPS, RPS, SPS, and TPS (sealed lead-acid batteries)	Battery capacity range	UL listed for battery charging of 6.2 Ah up to 110 Ah (110 Ah batteries 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	Operating Temp. Range	32° to 120°F (0° to 49° C)		
	Operating Humidity Range	Up to 93% RH, non-condensing @ 90° F (32° C) maximum		

Local Mode Controller Detail

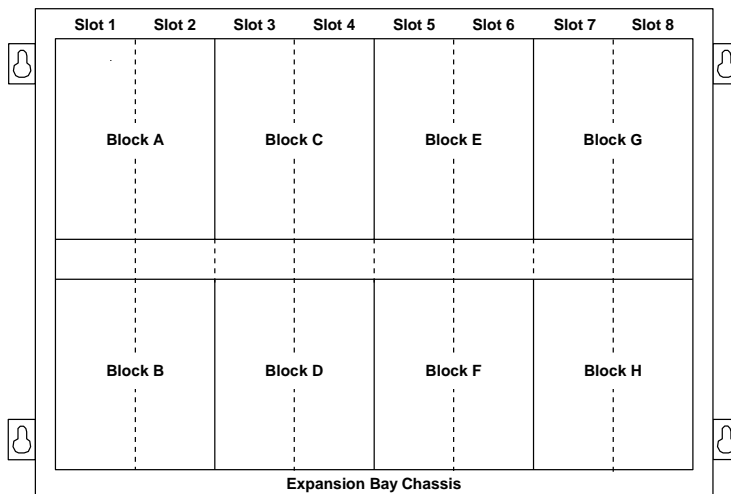
Matching box is supplied with surface mount models 4601-9109 (red) and 4601-9111 (beige); for semi-flush models 4601-9108 (red) and 4601-9110 (beige), use a 1-1/2" (38 mm) minimum depth, 3-gang box



Local Mode Controller to Transponder Wiring:

1. Wire close-nippled to transponder, maximum distance = 20 ft (6.1 m).
2. Nine wires required: 24 VDC (2), one per LED indicator (4), and one per switch (3).
3. Wire size, 18 AWG (0.82 mm²).

Expansion Bay Module Loading Reference

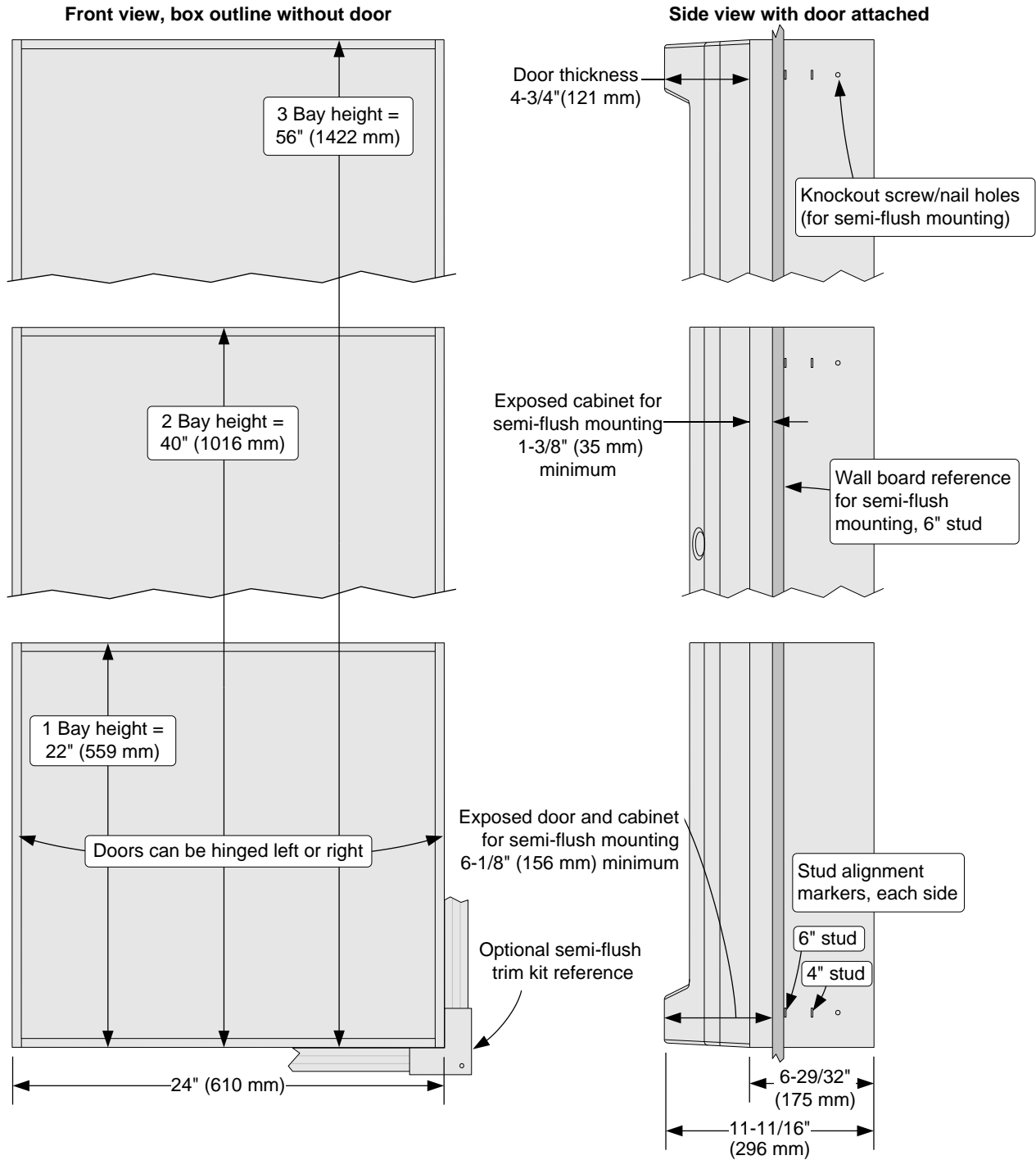


Size Definitions: Block = 4" W x 5" H (102 mm x 127 mm) card area
Slot = 2" W x 8" H (51 mm x 203 mm) motherboard with daughter card

Description	Mounting	
Transponder Interface Modules	Block A	
Audio Riser Modules	Block B	
Terminal Block Module	1 Block	
IDNet Modules	1 Block	
4, 2 A Relays	NON Power-limited	
4, 10 A Relays		1 Block
8, 3 A Relays		4", 2 Slots
VESDA Interface	1 Block	
Class B IDC	2", 1 Slot	
Class A IDC	2", 1 Slot	
MAPNET II Module	4", 2 Slots	
MAPNET II/IDNet Isolator	2", 1 Slot	
Decoder Module	6", 3 Slots	
System, Remote, or TrueAlert Power Supply	Blocks E, F, G & H ONLY	
Expansion Power Supply	Blocks G & H ONLY	
NAC Expansion Module	On XPS 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	
Telephone Expansion Module	1 Block	
Expansion Signal Module	1 Block	

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

Enclosure Installation Reference



NOTE: A system ground must be provided for Earth Detection and transient protection devices. This connection shall be made to an approved, dedicated Earth connection per NFPA 70, Article 250, and NFPA 780.

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S4100-0035-10

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Features

4100ES Box and door options:

- Boxes are available sized for one, two, or three equipment bays, each with a battery bay located at the bottom
- Colors include platinum or red
- Doors are glass front with modular dress panels, or solid
- Models are available with box and door combined for single package shipping, or packaged separately
- Enclosures are NEMA 1 rated
- Refer to individual 4100ES data sheets for product application listings (see list on page 2)

Door and dress panel selection is coordinated with cabinet function:

- Glass doors with modular dress panels provide visibility of annunciation and interface modules for Control Panels, Network Display Units (NDU), and Remote Annunciators
- Solid doors are for MINIPLEX Transponders and utility function cabinets where module visibility is not required

4100ES Enclosure details:

- Latching dress panels easily lift off for internal access
- Smooth box surfaces are provided for locally cutting conduit entrance holes exactly where required
- Alignment markers are provided at the top and bottom of each box side for 6" (152 mm) or 4" (102 mm) wall studs
- Knockout screw/nail holes are supplied for semi-flush mounting

Upright cabinet rack packaging reference:

- For use with Bud Industries Inc. special cabinet rack model number 45964
- Refer to page 2 for cabinet rack listing

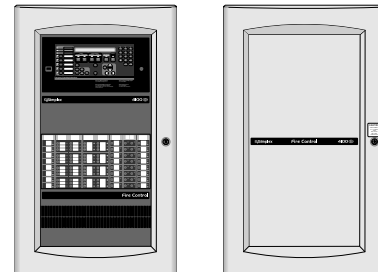
4009 TPS (TrueAlert Addressable Power Supply) cabinet assemblies:

- Cabinet assemblies are available for remote mounting of the TrueAlert addressable power supply (TPS)
- Refer to page 2 for listings information

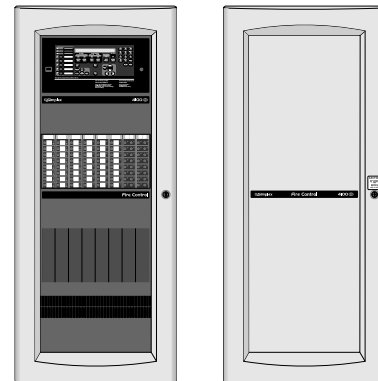
* For 4100ES one, two, and three bay cabinets with associated equipment: Products are listed by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listing 7165-0026:251 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. 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.



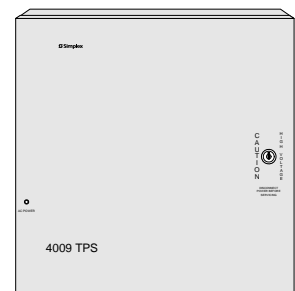
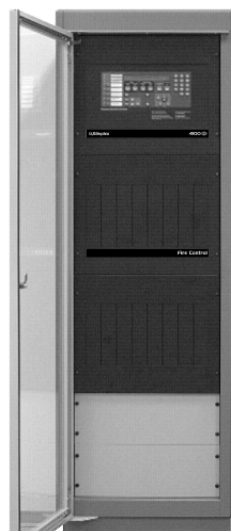
4100ES One Bay Cabinets



4100ES Two Bay Cabinets



4100ES Three Bay Cabinets



4009 TPS Cabinet Assembly (not to scale)

Cabinet Rack Enclosure (shown with door open)

Enclosure Selection Chart (refer to pages 3 and 4 for dimensions)

Combined Box and Door Selection (select if box and door are to be shipped together)

Description	Platinum 1 Bay	Platinum 2 Bay	Platinum 3 Bay	Red 1 Bay	Red 2 Bay	Red 3 Bay
Box with Glass Door and Dress Panel	2975-9444	2975-9445	2975-9446	2975-9441	2975-9442	2975-9443
Box with Solid Door	2975-9450	2975-9451	2975-9452	2975-9447	2975-9448	2975-9449

Model	Color	Description	Details
2975-9230	Beige	4009 TPS Cabinet Assembly for remote TrueAlert Power Supply (TPS) mounting	Includes box with door and mounting plate, input terminal block, and wiring harnesses; <i>Separately Order:</i> 4100 Series TPS (4100-5120 for US, 4100-5121 for Canada, 4100-5122, 240 VAC for international use), 4009-9813 Interface Card, and batteries (12.7 Ah maximum for cabinet mounting); refer to page 3, to data sheets S4100-0031 and S4009-0003, and instructions 579-875 for additional details [Listings: ETL Listed to UL864 & ULCS527; CSFM listed under 7300-0026:0368; FM Approved; NYC Fire Dept. acceptance]
2975-9229	Red		

Separate Box and Door Selection (select if boxes and doors are required to be shipped separately)

Description	Platinum 1 Bay	Platinum 2 Bay	Platinum 3 Bay	Red 1 Bay	Red 2 Bay	Red 3 Bay
Box	2975-9438	2975-9439	2975-9440	2975-9407	2975-9408	2975-9409
Glass Door and Dress Panel	4100-2104	4100-2105	4100-2106	4100-2124	4100-2125	4100-2126
Solid Door	4100-2114	4100-2115	4100-2116	4100-2134	4100-2135	4100-2136

Cabinet Rack Mounting (refer to page 4 for additional details)

Model	Description	#45964 Listings
#45964, from Bud Industries Inc.	Special upright cabinet rack for 4100ES; 19" (483 mm) E.I.A.; gray texture; includes front polycarbonate door and rear louvered door, both keyed with Simplex "B" keys	UL and ULC listed only as of document revision date; cabinets are listed with the Simplex 4100ES product line
4100-2140	Master Controller Rack Mount Kit, one required per master controller	Master Controller and Option Bays each require 9 Rack Units; 15.75" height (400 mm)
4100-2145	Option Bay Rack Mounting Kit, one required per expansion bay	
4100-2144	Power Distribution Module (PDM) Rack Mount Kit, order PDM separately per system voltage, one required per cabinet rack	

Power Distribution Modules (Not required for 4009 TPS Cabinets 2975-9229 and 2975-9230)

Model	Voltage	Description
4100-0634	120 VAC	Power Distribution Module (PDM); select per system voltage; one required per 4100ES box or cabinet rack
4100-0635	220/230/240 VAC	

Miscellaneous Accessories

Model	Description	
4100-9856	Canadian French Appliqué Kit, for 1, 2, or 3 bay sizes	
4100-9857	4100ES Appliqué Retrofit Kit, for 1, 2, or 3 bay sizes; use to identify 4100ES features when new door is not used; included with Master Controller Upgrade kits as detailed on data sheet S4100-0031	
4100-9835	Termination and Address Label Kit, for module marking	NOTE: One kit is supplied for each cabinet; order this if required for additional field module installation
4100-9837	Green LED Power-on Indicator Kit, required for ULC listing of MINIPLEX transponder	Mounts using knockout provided in solid door
2975-9813	Platinum semi-flush box trim	1-7/16" (37 mm) wide, four corners and trim pieces for top, bottom, and sides
2975-9812	Red semi-flush box trim	

Battery Reference

Model	Capacity	Model	Capacity	Battery Notes
2081-9272	6.2 Ah	2081-9287	25 Ah	<ol style="list-style-type: none"> Sealed lead-acid batteries, 12 VDC each; two required per battery location. Battery selection is required if batteries are internal. Select one size per battery set Refer to data sheet S2081-0006 for battery details.
2081-9274	10 Ah	2081-9276	33 Ah	
2081-9288	12.7 Ah	2081-9296	50 Ah	
2081-9275	18 Ah			

Battery Accessories

Model	Description
4100-0650	Battery Shelf, required for 50 Ah batteries
4100-5128	Battery Distribution Terminal Block, mounts to side of box, required for all close-nipped cabinets unless cabinet receives all power from power supplies and batteries located in the adjacent cabinet

Additional Data Sheet Reference

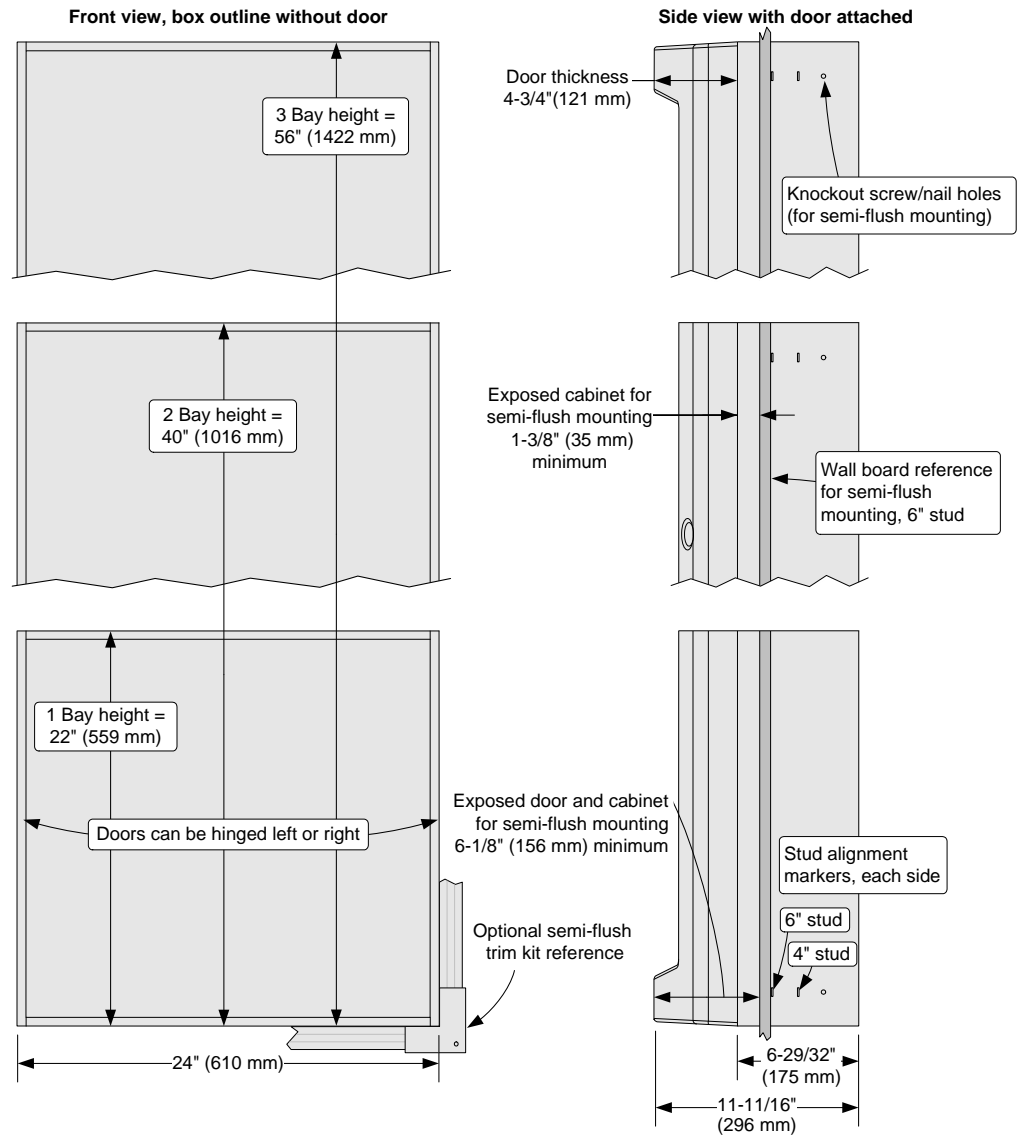
Subject	Data Sheet	Subject	Data Sheet
4100ES Basic Panel Modules and Accessories	S4100-0031	Network Display Unit (NDU)	S4100-0036
LED/Switch Modules	S4100-0032	Remote Annunciators	S4100-0038
4100ES Audio/Phone Modules	S4100-0034	InfoAlarm Command Center	S4100-0045
MINIPLEX Transponders	S4100-0035	Remote Battery Charger	S4081-0002

Wall Mounted Enclosure Installation Reference

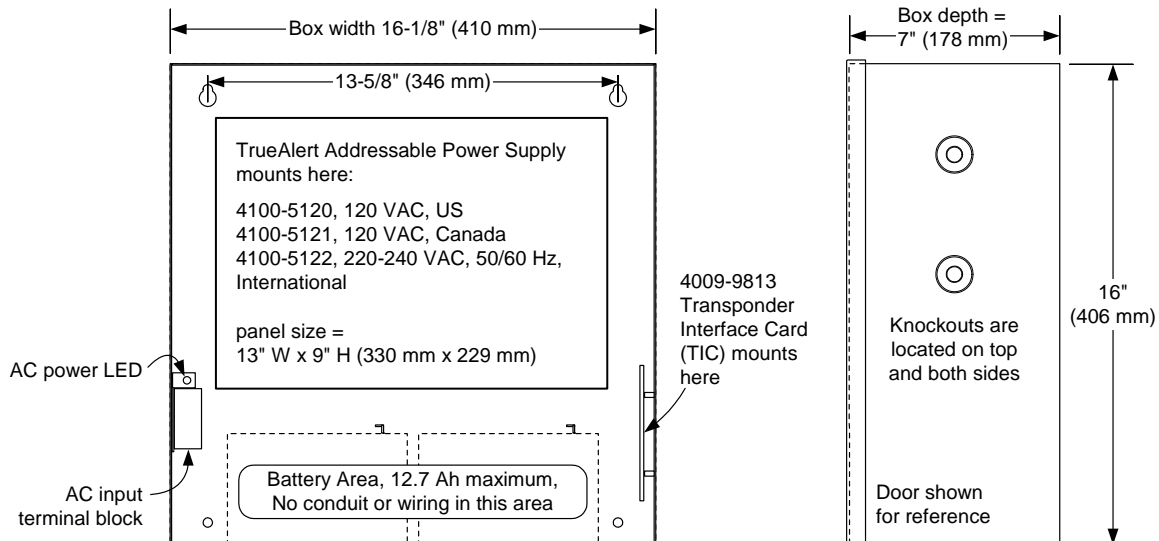
NOTE:

A system ground must be provided for Earth Detection and transient protection devices. This connection shall be made to an approved, dedicated Earth connection per NFPA 70, Article 250, and NFPA 780.

For additional installation information refer to Installation Instructions 579-117.



4009 TPS Cabinet Installation Reference



Console Package Reference



Front View

Side View

Rear View

Cabinet Rack Specifications (refer to Installation Instructions 579-229 for additional details)

Type	Upright cabinet rack for exclusive use with Simplex 4100ES Fire Alarm Products	
Supplier	Order from Bud Industries Inc. (www.budind.com)	
Model Number	45964	
Outside Dimensions	Height	69-7/8" (1775 mm)
	Width	24-1/16" (611 mm)
	Depth	22" (559 mm)
Color	Gray texture	
Panel Space Width	19" E.I.A. (483 mm)	
Front Door	Surface mount with 1/8" thick (3.18 mm) smoke gray polycarbonate, locked with Simplex "B" key, hinged on left of cabinet	
Rear Door	Ventilated top and bottom, locked with Simplex "B" key	
Sides	Side panels are removable from the inside for rack-to-rack mounting	
Bottom	Pan attached for battery mounting	
Levelers	Includes 4 stem levelers on bottom	

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S4100-0037-10 10/2011

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Features

Rechargeable, sealed lead-acid batteries:

- Lead-calcium grid structure with immobilized electrolyte in absorbent separator
- Low maintenance with no need to add water
- Low self-discharge characteristics
- One-piece, high impact polystyrene cell cover with high reliability dual seal construction
- UL 924 recognized pressure relief valves

Available in a variety of capacities:

- Batteries for internal mounting range from 6.2 Ah up to 50 Ah, depending on control panel cabinet size
- Larger batteries, up to 110 Ah, mount in external battery cabinets with models available with internal chargers

Battery cabinets with chargers:

- Battery cabinets with charger communicate with their connected fire alarm control panel and are available for 4100ES/4010ES/4100U Series and 4010 Series panels

Description

Simplex® rechargeable sealed-lead acid batteries provide reliable and repeatable discharge and recharge characteristics for use in fire alarm and other systems applications. They are designed with immobilized electrolyte in an absorbent separator, allowing them to provide rated capacity on the first cycle.

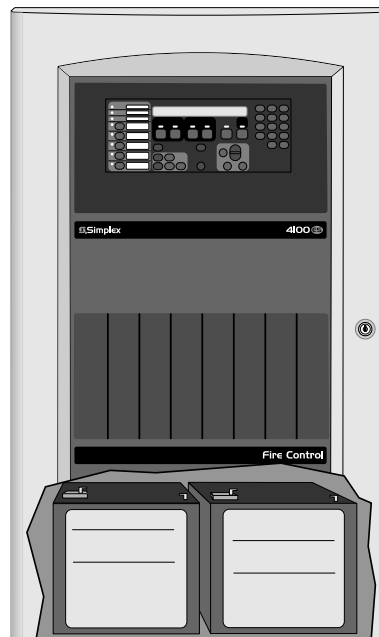
Because of their sealed construction, packaging is allowed within the system electronics enclosure (see illustration on page 2). When this is applicable, the quantity of system cabinets and the battery wiring distances are both minimized. Where required, external battery cabinets can be close-nipped to the control panel to house larger batteries with battery chargers available in some battery cabinet sizes.

Battery Details

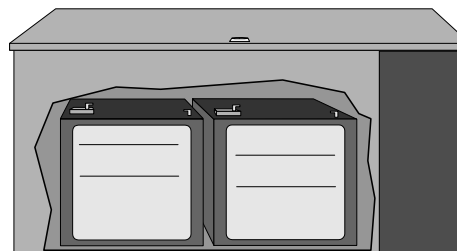
Charging. These batteries are intended to be used with compatible Simplex battery chargers.

Series Connections. These batteries are required to be connected in series to produce 24 V system voltage. Battery sets must be of identical voltage, model number, appearance, and approximately the same date of manufacture for proper operation.

Testing. Battery capacity testing is recommended to be performed by using a sealed lead-acid battery tester designed to withdraw a minimum of battery charge. The preferred tester applies a variety of amplitude and duration controlled test pulses that compares terminal voltage against those predicted for the specific battery size. (Testing is available through your local Simplex product supplier.)



Compatible Sealed Lead-Acid Batteries can be Installed Inside Fire Alarm Control Panel Cabinets



Remote Battery Cabinets are Available for Larger Battery Requirements

Battery Details (Continued)

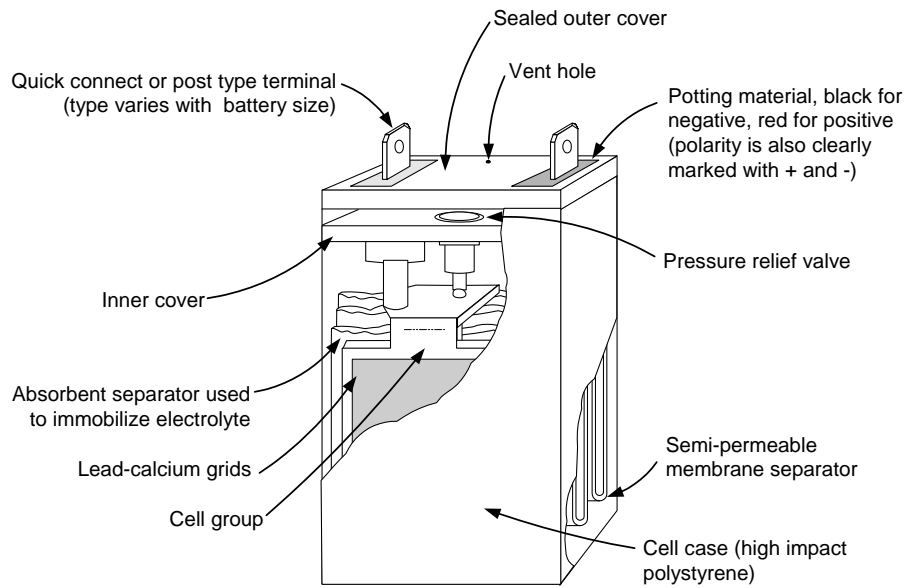
Shipping. Sealed lead-acid batteries are shipped via ground or sea transportation only. They are not shipped via air.

Disposal. Battery chemicals and materials can be recycled. Refer to information shipped with the battery or on its case. Return to the battery manufacturer or to a similarly qualified battery processing facility for proper disposal.

* Refer to details on page 4 and to the referenced individual product data sheets for agency listing status of battery cabinets and chargers. The batteries detailed in this document meet the requirements of UL, ULC, and Factory Mutual for use with respective equipment battery chargers as listed on page 3. Contact your local Simplex product supplier for proper battery selection per system requirements. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Fire Protection Products.

Battery Construction Reference

Actual appearance will vary with battery size.



Battery Size Specifications

Battery Model	Capacity @ 20 Hour Discharge Rate	Width*	Depth*	Height with Terminals	Approximate Weight*
2081-9272	6.2 Ah	6-1/8" (156 mm)	2-5/8" (67 mm)	4" (102 mm)	5.75 lbs (2.6 kg)
2081-9274	10 Ah	6" (153 mm)	4-1/16" (103 mm)	4" (102 mm)	9.2 lbs (4.2 kg)
2081-9288	12.7 Ah	6" (153 mm)	4" (102 mm)	4" (102 mm)	9 lbs (4.1 kg)
2081-9275	18 Ah	7-1/4" (184 mm)	3-3/8" (86 mm)	6-5/8" (168 mm)	14.3 lbs (6.5 kg)
2081-9287	25 Ah	6-5/8" (168 mm)	5" (127 mm)	7" (178 mm)	19.4 lbs (8.8 kg)
2081-9271 (rectangular case, typically for service)	33 Ah	12-1/2" (318 mm)	3-3/8" (86 mm)	7-1/16" (179 mm)	26.6 lbs (12.1 kg)
2081-9276 ("square" case, use for new)	33 Ah	7-3/4" (197 mm)	5-1/4" (133 mm)	6-3/4" (171 mm)	26.5 lbs (12 kg)
2081-9296	50 Ah	9" (229 mm)	5-1/2" (140 mm)	8-7/8" (225 mm)	41.8 lbs (19 kg)
2081-9279	110 Ah	11-3/16" (284 mm)	10-1/2" (267 mm)	9" (230 mm)	82 Lbs (37 kg)

* Dimensions and weight are per battery and are for reference only. Exact size may vary. Refer to the tables on page 3 for mounting compatibility. These batteries are 12 V each and series connected for 24 V system use.

NOTE: When wired in series for 24 V output, these batteries are to be of identical voltage, appearance, model number, and approximately the same date of manufacture.

General Battery Specifications

Nominal Voltage Rating	12 Volts per battery
Discharge Rating	20 Hour Rate
Typical Charge/Discharge Cycles	100 to 150
Preferred Charge Temperature Range	60° F to 90° F (15.6°C to 32.2° C)

Battery Compatibility for Fire Alarm Control Panel Mounting

NOTE: Refer to individual fire alarm control panel product data sheets for additional battery application information

Battery Model	Capacity	Simplex Control Panel Model Series (see legend and notes below)									
		4003EC	4004R	4005	4006 & 4008	4009 (all models)	4010	4010ES	4100ES/ 4100U	4100 & 4120 (2, 4 or 6-Unit)	4020 (2, 4 or 6-Unit)
2081-9272	6.2 Ah	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2081-9274	10 Ah	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2081-9288	12.7 Ah	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2081-9275	18 Ah	Ext	Note 3	✓	Ext	Ext	Note 2	✓	✓	✓	✓
2081-9287	25 Ah	Ext	Note 3	Ext	Ext	NA	✓	✓	✓	✓	Ext
2081-9271 rectangular	33 Ah	Ext	Note 3	Ext	NA	NA	Note 3	✓	✓	Ext	Note 4
2081-9276 "square"	33 Ah	Ext	Note 3	Ext	NA	NA	Note 3	✓	✓	✓	Ext
2081-9296	50 Ah	NA	Note 3	NA	NA	NA	Note 3	Note 6	2 or 3 bay	Ext	Ext
2081-9279	110 Ah	Requires external battery cabinet, compatible with 4100ES, 4010ES, 4100, and 4120 Series only									

✓ = Can be placed in the respective equipment cabinet

Ext = External battery cabinet is required, refer to selection chart on page 4

NA = Not applicable/not compatible

NOTES:

- These batteries meet the requirements of UL, ULC, and Factory Mutual for use with respective equipment battery chargers listed above. Contact your local Simplex product supplier for proper battery selection per system requirements.
- 4010 Cabinets will accommodate 2081-9275, 18 Ah batteries, but will not allow bottom entry conduit.
- Use 4081 series companion cabinet and charger, refer to page 4.
- 4020 Cabinets will accommodate 2081-9271, 33 Ah batteries, but will not allow bottom entry conduit.
- Some control panel models are listed for battery replacement reference only.
- For 2 bay international applications only, 50 Ah batteries will fit in the cabinet.

External Battery Cabinet Compatibility Reference

Battery Cabinets without Chargers (connects to charger in panel)

Cabinet	Panel Compatibility	Battery					
		2081-9275 18 Ah*	2081-9287 25 Ah	2081-9271 Rectangular 33 Ah	2081-9276 Square 33 Ah	2081-9296 50 Ah	2081-9279 110 Ah
2081-9280	4100ES, 4010ES, 4100U, and 4100+	NA	NA	NA	NA	NA	✓
2081-9281 2081-9282	multiple	✓	✓	✓	✓	✓	NA
4009-9801	multiple	✓	✓**	NA	NA	NA	NA
4009-9802	multiple	✓	NA	✓	NA	NA	NA

Battery Cabinets with Chargers

Cabinet	Panel Compatibility	2081-9275 18 Ah*	2081-9287 25 Ah	2081-9271 Rectangular 33 Ah	2081-9276 Square 33 Ah	2081-9296 50 Ah	2081-9279 110 Ah
4081-9301 4081-9302	4004R and 4010	✓	✓	✓	✓	✓	NA
4081-9306 4081-9308	4100ES, 4010ES, and 4100U	NA	NA	NA	NA	✓	✓

* Batteries smaller than those listed are normally mounted in the product cabinet

** 25 Ah capacity was effective as of 7/2005.

✓ = Can be placed in the respective equipment cabinet

NA = Not applicable/not compatible

External Battery Cabinet Specification Reference

Battery Cabinets Without Chargers; Shallow Design with Front Door

Model	Color	Listings	Description	Dimensions
2081-9281	Beige	UL and FM	2-Unit, 4100 style cabinet without charger; with locking solid door and battery shelf, primarily for use with 50 Ah batteries	25-3/4" W x 20-3/4" H x 6-3/4" D (654 mm x 527 mm x 171 mm)
2081-9282	Red			
4003-9860	Beige	Multiple	Intended for use with 4003EC systems, for up to 33 Ah batteries (refer to 4003EC data sheet S4003-0002)	9-1/2" H x 24" W x 9" D (241 mm x 610 mm x 229 mm)
4009-9801*	Beige	UL and FM	For up to 25 Ah batteries* External battery cabinet without charger, with locking solid door and battery harness; for close-nipped mounting to fire alarm control panel cabinet	16-1/4" W x 13-1/2" H x 5-3/4" D (413 mm x 343 mm x 146 mm)*
4009-9802	Beige	UL		

* Depth increased for 25 Ah batteries effective 7/2005.

Chargers for use with 4010 Fire Alarm Control Panels and 4004R Suppression Release Systems

(refer to data sheet S4081-0001)

Model	Color	Input Voltage	Description	Dimensions
4081-9301	Beige	120 VAC	Battery cabinet with charger for the 4010 and 4004R fire alarm control panel; for up to 50 Ah batteries ; with front door <i>Listings include: UL, ULC, FM, CSFM, and MEA (NYC), see data sheet for details</i>	22-1/2" W x 16-3/4" H x 8-3/8" D (572 mm x 425 mm x 213 mm)
4081-9302	Red			

Battery Cabinet Without Charger for 110 Ah Batteries; for use with compatible panel mounted chargers

(refer to data sheet S2081-0012)

Model & Listings	Color	Cabinet Description	Compatible Chargers	Charger Description	Dimensions
2081-9280 <i>Listings include: UL and CSFM</i>	Red	Battery cabinet for 2081-9279, 110 Ah batteries; includes 80 A battery fuse, terminals and battery connection cables; see data sheet for details	4010-9xxx Series	4010ES Main System Supply (MSS)	26-1/2" W x 12" H x 12" D (673 mm x 305 mm x 305 mm)
			4100-9xxx Series	4100ES/4100U System Power Supplies (SPS)	
			4100-5111 4100-5112 4100-5113	4100ES/4100U Additional SPS	
			4100-5125 4100-5126 4100-5127	4100ES/4100U Remote Power Supply (RPS)	
			4100-5120 4100-5121 4100-5122	4100ES/4100U TrueAlert Addressable Power Supply (TPS)	
			4100-0104 4100-0114 4100-0124	4100 Legacy power supplies	

4100ES/4010ES/4100U Compatible Battery Cabinet With Charger for 110 Ah Batteries (for ULC listed systems and for other applications unable to use panel mounted power supply charger; refer to data sheet S4081-0002)

Model	Color	Input Voltage	Description	Dimensions
4081-9306	Red	120 VAC	Battery cabinet with charger for up to 110 Ah batteries; NOTE: Required for ULC listed charging of 110 Ah batteries; <i>Listings include: UL, ULC, FM, CSFM, and MEA (NYC), see data sheet for details</i>	27-7/8" W x 13-1/2" H x 14-5/8" D (708 mm x 343 mm x 371 mm)
4081-9308	Red	220/230/240 VAC, multi-tapped		
4100-9837	Green LED Power-on Indicator Kit, required for ULC listing , mounts above access panel using knockout provided			

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S2081-0006-20 1/2012

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INSERT 3

INITIATING/ADDRESSABLE DEVICES &
ACCESSORIES

Features

TrueAlarm analog sensing provides:

- Digital transmission of analog sensor values via IDNet or MAPNET II two-wire communications

For use with the following Simplex® products:

- 4100ES, 4100U, 4010ES, and 4010 Series control panels; and 4008 Series control panels with reduced feature set (refer to data sheet S4008-0001 for details)
- 4020, 4100, and 4120 Series control panels, Universal Transponders, and 2120 TrueAlarm CDTs equipped for MAPNET II operation

Fire alarm control panel provides:

- Peak value logging allowing accurate analysis of each sensor for individual sensitivity selection
- Sensitivity monitoring satisfying NFPA 72 sensitivity testing requirements; automatic individual sensor calibration check verifies sensor integrity
- Automatic environmental compensation, multi-stage alarm operation, and display of sensitivity directly in percent per foot
- Ability to display and print detailed sensor information in plain English language

Photoelectric smoke sensors provide:

- Seven levels of sensitivity from 0.2% to 3.7% (refer to additional information on page 3)

Heat sensors provide:

- Fixed temperature sensing
- Rate-of-rise temperature sensing
- Utility temperature sensing
- Listed to UL 521 and ULC-S530

Ionization smoke sensors provide:

- Three levels of sensitivity; 0.5%, 0.9%, and 1.3% (refer to additional information on page 3)

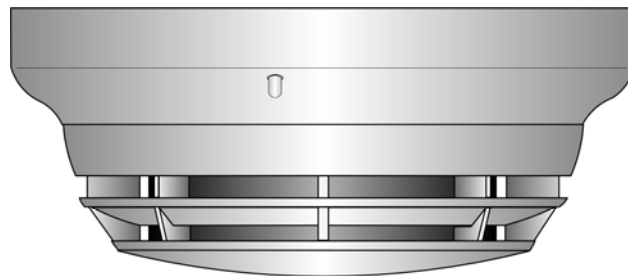
General features:

- Listed to UL 268 and ULC-S529
- Louvered smoke sensor design enhances smoke capture by directing flow to chamber; entrance areas are minimally visible when ceiling mounted
- Designed for EMI compatibility
- Magnetic test feature is provided
- Optional accessories include remote LED alarm indicator and output relays

Additional base reference:

- For isolator bases, refer to data sheet S4098-0025
- For sounder bases, refer to data sheet S4098-0028
- For photo/heat sensors, refer to data sheet S4098-0024 (single address) and S4098-0033 (dual address)

* These products have been approved by the California State Fire Marshal (CSFM) pursuant to Section 13144.1 of the California Health and Safety Code. See CSFM Listings 7272-0026:218, 7271-0026:231, 7270-0026:216, and 7300-0026:217 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. 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.



4098-9714 TrueAlarm Photoelectric
Sensor Mounted in Base

Description

Digital Communication of Analog Sensing.

TrueAlarm analog sensors provide an analog measurement digitally communicated to the host control panel using Simplex addressable communications. At the control panel, the data is analyzed and an average value is determined and stored. An alarm or other abnormal condition is determined by comparing the sensor's present value against its average value and time.

Intelligent Data Evaluation. Monitoring each sensor's average value provides a continuously shifting reference point. This software filtering process compensates for environmental factors (dust, dirt, etc.) and component aging, providing an accurate reference for evaluating new activity. With this filtering, there is a significant reduction in the probability of false or nuisance alarms caused by shifts in sensitivity, either up or down.

Control Panel Selection. Peak activity per sensor is stored to assist in evaluating specific locations. The alarm set point for each TrueAlarm sensor is determined at the host control panel, selectable as more or less sensitive as the individual application requires.

Timed/Multi-Stage Selection. Sensor alarm set points can be programmed for timed automatic sensitivity selection (such as more sensitive at night, less sensitive during day). Control panel programming can also provide multi-stage operation per sensor. For example, a 0.2% level may cause a warning to prompt investigation while a 2.5% level may initiate an alarm.

Sensor Alarm and Trouble LED Indication. Each sensor base's LED pulses to indicate communications with the panel. If the control panel determines a sensor is in alarm, or is dirty or has some other type of trouble, the details are annunciated at the control panel and that sensor base's LED will be turned on steadily. During a system alarm, the control panel will control the LEDs such that an LED indicating a trouble will return to pulsing to help identify the alarmed sensors.

TrueAlarm Sensor Bases and Accessories

Sensor Base Features

Base mounted address selection:

- Address remains with its programmed location
- Accessible from front (DIP switch under sensor)

General features:

- Automatic identification provides default sensitivity when substituting sensor types
- Integral red LED for power-on (pulsing), or alarm or trouble (steady on)
- Locking anti-tamper design mounts on standard outlet box
- Magnetically operated functional test

Sensor Bases

4098-9792, Standard sensor base

4098-9789, Sensor base with wired connections for:

- 2098-9808 Remote LED alarm indicator or 4098-9822 relay (unsupervised)

4098-9791, Sensor base with supervised relay driver output (not compatible with 2120 CDT):

- Relay operation is programmable and can be manually operated from control panel
- Use with remote mount 2098-9737 relay
- Also includes wired connections for remote LED alarm indicator or 4098-9822 relay

Sensor Base Options

2098-9737, Remote or local mount supervised relay:

- DPDT contacts for resistive/suppressed loads, power limited rating of 3 A @ 28 VDC; non-power limited rating of 3 A @ 120 VAC (requires external 24 VDC coil power)

4098-9822, LED Annunciation Relay:

- Activates when base LED is on steady, indicating local alarm or trouble
- DPDT contacts for resistive/suppressed loads, power limited rating of 2 A @ 28 VDC; non-power limited rating of 1/2 A @ 120 VAC, (requires external 24 VDC coil power)

4098-9832, Adapter plate:

- Required for surface or semi-flush mounting to 4" square electrical box and for surface mounting to 4" octagonal box
- Can be used for cosmetic retrofitting to existing 6-3/8" diameter base product

2098-9808, Remote red LED Alarm Indicator:

- Mounts on single gang box (shown in illustration to right)



Description

TrueAlarm sensor bases contain integral addressable electronics that constantly monitor the status of the detachable photoelectric, ionization, or heat sensors. Each sensor's output is digitized and transmitted to the system fire alarm control panel every four seconds.

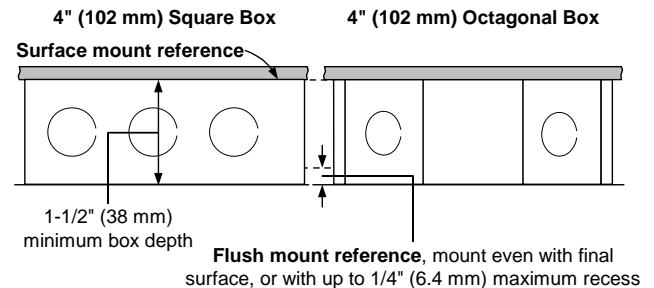
Since TrueAlarm sensors use the same base, different sensor types can be easily interchanged to meet specific location requirements. This feature also allows intentional sensor substitution during building construction. When conditions are temporarily dusty, instead of covering the smoke sensors (causing them to be disabled), heat sensors may be installed without reprogramming the control panel. Although the control panel will indicate an incorrect sensor type, the heat sensor will operate at a default sensitivity providing heat detection for building protection at that location.

Mounting Reference

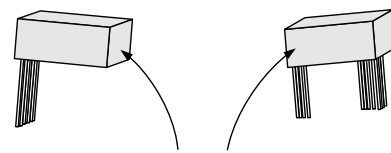
Electrical Box Requirements: (boxes are by others)

Without relay: 4" octagonal or 4" square, 1-1/2" deep; single gang, 2" deep

With relay: 4" octagonal or 4" square, 1-1/2" deep, with 1-1/2" extension ring

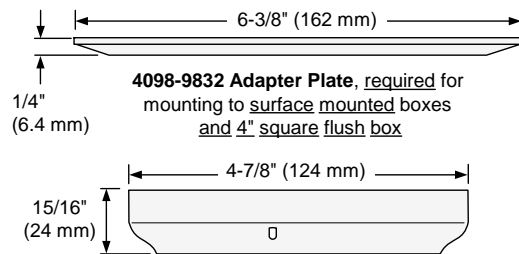


2098-9737 Relay (mounts in base electrical box or remotely) **4098-9822 Relay** (mounts in base electrical box)



Relay Size: 2-1/2" X 1-1/2" X 1" (3.75 cubic inches)
(64 mm X 38 mm X 25.4 mm)

NOTE: Review total wire count, wire size, and accessories being wired to determine required box volume.



TrueAlarm Bases
4098-9789, -9791, & -9792

TrueAlarm Sensors

Features

Sealed against rear air flow entry

Interchangeable mounting

EMI/RFI shielded electronics

Heat sensors:

- Selectable rate compensated, fixed temperature sensing with or without rate-of-rise operation
- Rated spacing distance between sensors:

Fixed Temp. Setting	UL & ULC Spacing	FM Spacing, Either Fixed Temperature Setting
135° F (57.2° C)	60 ft x 60 ft (18.3 m)	20 ft x 20 ft (6.1 m) for fixed temperature only; RTI = Quick
155° F (68° C)	40 ft x 40 ft (12.2 m)	50 ft x 50 ft (15.2 m) for fixed temperature with either rate-of-rise selection; RTI = Ultra Fast

Smoke Sensors:

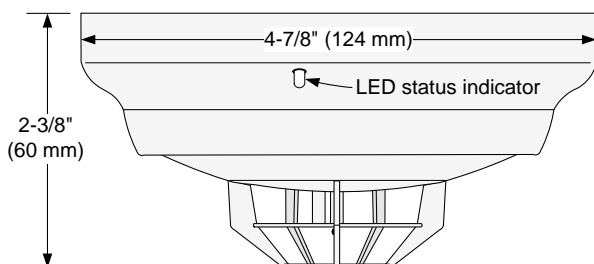
- Photoelectric or ionization technology sensing
- 360° smoke entry for optimum response
- Built-in insect screens

4098-9733 Heat Sensor

TrueAlarm heat sensors are self-restoring and provide rate compensated, fixed temperature sensing, selectable with or without rate-of-rise temperature sensing. Due to its small thermal mass, the sensor accurately and quickly measures the local temperature for analysis at the fire alarm control panel.

Rate-of-rise temperature detection is selectable at the control panel for either 15° F (8.3° C) or 20° F (11.1° C) per minute. Fixed temperature sensing is independent of rate-of-rise sensing and programmable to operate at 135° F (57.2° C) or 155° F (68° C). In a slow developing fire, the temperature may not increase rapidly enough to operate the rate-of-rise feature. However, an alarm will be initiated when the temperature reaches its rated fixed temperature setting.

TrueAlarm heat sensors can be programmed as a utility device to monitor for temperature extremes in the range from 32° F to 155° F (0° C to 68° C). This feature can provide freeze warnings or alert to HVAC system problems. *Refer to specific panels for availability.*



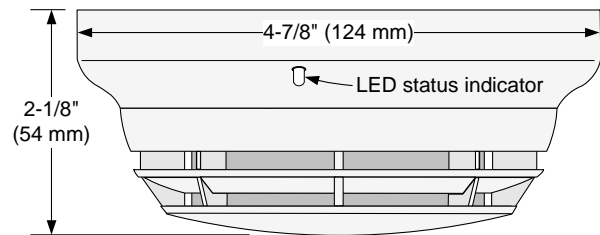
4098-9733 Heat Sensor with Base

WARNING: In most fires, hazardous levels of smoke and toxic gas can build up before a heat detection device would initiate an alarm. In cases where Life Safety is a factor, the use of smoke detection is highly recommended.

4098-9714 Photoelectric Sensor

TrueAlarm photoelectric sensors use a stable, pulsed infrared LED light source and a silicon photodiode receiver to provide consistent and accurate low power smoke sensing. Seven levels of sensitivity are available for each individual sensor, ranging from 0.2% to 3.7% per foot of smoke obscuration. Sensitivities of 0.2%, 0.5%, and 1% are for special applications in clean areas. Standard sensitivities are 1.5%, 2.0%, 2.5%, and 3.7%. Sensitivity is selected and monitored at the fire alarm control panel.*

The sensor head design provides 360° smoke entry for optimum response to smoke from any direction. Due to its photoelectric operation, air velocity is not normally a factor, except for impact on area smoke flow.

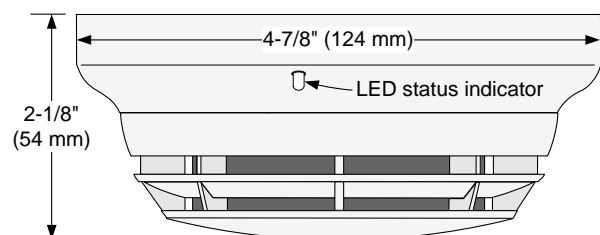


4098-9714 Photoelectric Sensor with Base

4098-9717 Ionization Sensor

TrueAlarm Ionization sensors use a single radioactive source with an outer sampling ionization chamber and an inner reference ionization chamber to provide stable operation under fluctuations in environmental conditions such as temperature and humidity. Smoke and invisible combustion gases can freely penetrate the outer chamber. With both chambers ionized by a small radioactive source [Am 241 (Americium)], a very small current flows in the circuit. The presence of particles of combustion will cause a change in the voltage ratio between chambers. This difference is measured by the electronics in the sensor base and digitally transmitted back to the control panel for processing.

Three levels of sensitivity are available for each ionization sensor: 0.5, 0.9, and 1.3% per foot of smoke obscuration. Sensitivities of 0.5% and 0.9% are for special applications in clean areas. Standard sensitivity is 1.3%. Sensitivity is selected and monitored at the fire alarm control panel.*



4098-9717 Ionization Sensor with Base

Application Reference

Sensor locations should be determined only after careful consideration of the physical layout and contents of the area to be protected. Refer to NFPA 72, the *National Fire Alarm and Signaling Code*. On smooth ceilings, smoke sensor spacing of 30 ft (9.1 m) may be used as a guide.*

* For detailed application information including sensitivity selection, refer to Installation Instructions 574-709.

TrueAlarm Analog Sensing Product Selection Chart

TrueAlarm Sensor Bases

(Refer to Application Manual 574-709 and Installation Instructions 574-707 for additional information)

Model	Description	Compatibility	Mounting Requirements
4098-9792	Standard Sensor Base, no options	Sensors 4098-9714, -9733, & -9717	4" octagonal or 4" square box, 1-1/2" min. depth; or single gang box, 2" min. depth
4098-9789	Sensor Base with connections for Remote LED Alarm Indicator or Unsupervised Relay	Sensors 4098-9714, -9733, & -9717 2098-9808 remote LED alarm indicator or 4098-9822 relay	4" octagonal or 4" square box Note: Box depth requirements depend on total wire count and wire size, refer to accessories list below for reference.
4098-9791**	Sensor Base with connections for Supervised Remote Relay and connections for Remote Alarm Indicator or Unsupervised Relay	Sensors 4098-9714, -9733, & -9717 2098-9737 remote relay (supervised) 2098-9808 remote alarm indicator or 4098-9822 relay (unsupervised)	** NOTE: 4098-9791 is NOT compatible with the 2120 CDT

TrueAlarm Sensors

Model	Description	Compatibility	Mounting Requirements
4098-9714	Photoelectric Smoke Sensor	Bases 4098-9792, 4098-9789, and 4098-9791	Refer to base requirements
4098-9717	Ionization Smoke Sensor		
4098-9733	Heat Sensor		

TrueAlarm Sensor/Base Accessories

Model	Description	Compatibility	Mounting Requirements
2098-9737	Supervised Relay, mounts remote or in base electrical box	For use with 4098-9791 base	Remote Mounting requires 4" octagonal or 4" square box, 1-1/2" minimum depth Base Mounting requires 4" octagonal box, 2-1/8" deep with 1-1/2" extension ring
2098-9808	Remote Red LED Alarm Indicator on single gang stainless steel plate	Bases 4098-9789 and 4098-9791	Single gang box, 1-1/2" minimum depth
4098-9822	Relay, tracks base LED status (unsupervised, mounts only in base electrical box)		4" octagonal box, 2-1/8" deep with 1-1/2" extension ring
4098-9832	Adapter Plate	Bases 4098-9792, -9789, & -9791	Required for surface or semi-flush mounted 4" square box and for surface mounted 4" octagonal box

Specifications

General Operating Specifications

Communications and Sensor Supervisory Power	MAPNET II or IDNet, auto-select, 24-40 VDC w/data, 400 μ A typical, 1 address per base	
Communications Connections	Screw terminals for in/out wiring, 18 to 14 AWG (0.82 mm ² to 2.08 mm ²)	
Remote LED Alarm Indicator Current	1 mA typical, no impact to alarm current	
Remote LED Alarm Indicator and Relay Connections	Color coded wire leads, 18 AWG (0.82 mm ²)	
UL Listed Temperature Range	32° to 100° F (0° to 38° C)	
Operating Temperature Range	with 4098-9717 or 4098-9733	32° to 122° F (0° to 50° C)
	with 4098-9714	15° to 122° F (-9° to 50° C)
Humidity Range	10 to 95% RH	
Smoke Sensor	4098-9714, Photoelectric Sensor	Air velocity = 0-4000 ft/min (0-1220 m/min)
Ambient Ratings	4098-9717, Ionization Sensor	Air velocity = 0-200 ft/min (0-61 m/min); Altitude is up to 8000 ft (2.4 km)
Housing Color	Frost White	
4098-9791 Base With Supervised Remote Relay 2098-9737 (see page 2 for contact ratings)		
Externally Supplied Relay Coil Voltage	18-32 VDC (nominal 24 VDC)	
Supervisory Current	270 μ A, from 24 VDC supply	
Alarm Current with 2098-9737 Relay	28 mA, from 24 VDC supply	
4098-9822 Unsupervised Relay, Requirements for Bases 4098-9789 and 4098-9791 (see page 2 for contact ratings)		
Externally Supplied Relay Coil Voltage	18-32 VDC (nominal 24 VDC)	
Supervisory Current	Supplied from communications	
Alarm Current	13 mA from separate 24 VDC supply	

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INSERT 4

NOTIFICATION APPLIANCES & ACCESSORIES



Features

Individually addressed and controlled multi-candela V/O (visible only) notification appliances provide:

- High intensity multi-candela xenon strobe with intensity *programmable from a Simplex® 4100U fire alarm control panel with TrueAlert Addressable Power Supply (TPS)* or jumper selected as 15, 30, 75, or 110 cd
- Synchronized 1 Hz strobe flash rate
- Wiring supervision to each appliance allowing “T-tapped” connections for Class B circuits to simplify wiring (Class A circuits require in/out wiring)
- Backwards compatibility with fixed candela TrueAlert addressable strobes on same Signaling Line Circuit (SLC) allowing convenient expansion and replacement
- Compatibility with ADA requirements; (refer to important installation information on page 4)
- UL listed to Standard 1971

Compatible TrueAlert Addressable Host Controls:

- *4100U TrueAlert Addressable Power Supply (TPS)* mounted in the control panel or in a remote cabinet
- *TrueAlert Addressable Controller (4009T)* interface panel

With multi-candela appliances and 4100U fire alarm control panels with TPS, TrueNAC™ voltage drop diagnostics provide:

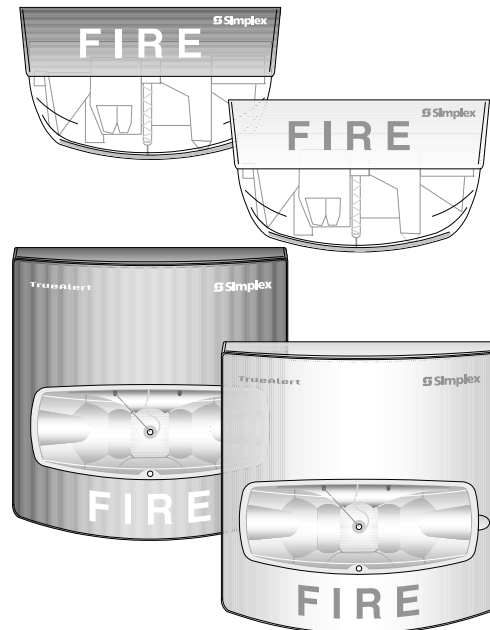
- *Individual appliance voltage drop analysis* using appliance intensity selection, measured appliance voltage, and SLC output voltage and current**
- *Device Reports* that detail type, candela rating, and location of addressable appliances on the SLC (*also available with TrueAlert Addressable Controller connected to 4100U using RUI communications*)
- *Status Reports* that list the diagnostic results per appliance on the SLC (see details on page 2)
- Requires 4100U Software Revision 12.04 or higher and compatible TPS version

LED indicator and magnet test feature:

- Appliance LED can be selected to display each polling cycle to indicate appliance supervision
- In diagnostic mode, the magnet test pulses the LED to indicate appliance address **AND pulses to indicate the intensity selection**; a brief output of the strobe is also selectable to confirm operation

Mechanical design features:

- Rugged, high impact, flame retardant thermoplastic housings are available in red or white for flush or surface, wall or ceiling mount
- Rear of housing does not extend into box and easily mounts to standard electrical boxes
- Access to wall mount in/out wiring terminals (18 AWG to 12 AWG) from front of housing assists installation, inspection, and testing
- Mounting options include electrical box adapters, separate covers to convert color, and red wire guards



Wall and Ceiling Mount Addressable V/Os

Description

TrueAlert Addressable Multi-Candela Strobes are individually addressed and individually controlled with power, supervision, and control supplied from a TrueAlert Addressable SLC.

4100U Additional Features. When controlled from a Simplex 4100U control panel with TPS, additional features are available such as software selection of strobe intensity, detailed reports of actual appliance intensity selection (see sample reports on page 2), TrueNAC voltage drop diagnostics, and additional setup and test diagnostics (further detailed on page 2).

Strobe Intensity Selection

Selectable at Appliance or Remotely Selected.

During installation, a plug at the back of the housing (visible after installation) is inserted to select strobe output as 15, 30, 75, or 110 cd; **or FACP**. *FACP is the factory default setting and allows a 4100U control panel with TPS to program the output intensity.*

FACP Selection Advantages. When intensity is selected in software from a 4100U fire alarm panel, it can be easily changed if renovations or other usage conditions are revised, and intensity selection errors at installation are effectively eliminated.

* See page 3 for wire guard listings. 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 7125-0026:235 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. 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 Safety Products Westminster.

** TrueAlert addressable notification is protected under U.S. Patent Nos. 6,313,744; 6,426,697; 6,693,532; 7,006,003; and 7,091,847. TrueNAC diagnostics are protected under U.S. patent No. 7,333,010.

Strobe Application Reference

Proper selection of visible notification is dependent on occupancy, location, local codes, and proper applications of: the *National Fire Alarm Code*[®] (NFPA 72[®]), ANSI A117.1; the appropriate model building code: BOCA, ICBO, or SBCCI; and the application guidelines of the Americans with Disabilities Act (ADA).

TrueAlert Addressable Advantage

TrueAlert Addressable Operation provides separate audible and visible appliance control functions using a single two-wire circuit that also *confirms connection to the individual notification appliance's electronic circuit*. This operation increases circuit supervision integrity by providing supervision beyond the appliance wiring connections.

Opportunities for Reducing Installation and Testing Time. Separate controls carried on the same two-wire SLC can significantly reduce installation time and expense for both retrofit and new construction. When Class B (Style 4) wiring is used, *wiring can be T-tapped*, allowing savings in distance, wire, junction boxes, and overall installation efficiency. In addition, TrueNAC diagnostics further improve installation efficiency by analyzing individual appliance wiring connections.

Addressable Product Reference

Product	Data Sheet
A/V (horn/strobe)	S4906-0005
S/V (speaker/strobe)	S4906-0006
Amber Lens Strobes (Mass Notification)	S4906-0007
TrueAlert Isolator	S4905-0001
TrueAlert Addressable Horn	S4901-0012
TrueAlert Addressable Controller (4009T)	S4009-0003
4100U Fire Alarm Panels	S4100-0031

TrueAlert Device and Device Status Reports

Service Port		Page 1	
REPORT 5 : TrueAlert Device Report		12:34:56am	WED 2-Jan-08
POINT ID	CUSTOM LABEL	DEVICE TYPE	CANDELA
T14-1-1	Location Label . . . up to 40 characters	V/O	15
T14-1-2	Break Room 5	A/V	110
T14-1-3	Boiler Room	A/V	75
T14-1-4	Elec. Room 7	A/V	30

Service Port		Page 1	
REPORT 6 : TrueNAC Status Report		12:34:56am	WED 2-Jan-08
POINT ID	CUSTOM LABEL	TEST RESULT	
TPS AT ADDRESS 3			
SLC 1			
T14-1-1	Location Label . . . up to 40 characters	PASSED	
T14-1-3	West Hall South End	PASSED	
T14-1-5	Classroom 2	PASSED	
T14-1-6	Classroom 3	FAILED	-0.6
NOMINAL CURRENT (A) :		1.34	
WORST CASE CURRENT (A) :		1.97	
WORST CASE VOLTAGE ABOVE/BELOW THRESHOLD (V) :		-0.6	
SLC HAS NOT PASSED UNLESS ALL DEVICES ARE MARKED AS PASSED			

TrueAlert Addressable Diagnostics

Appliance Type and Intensity Check. The TrueAlert Addressable Host Control is programmed with address, location, device type, and intensity selection. An incorrect appliance replacement or substitution will produce a location specific trouble allowing easy correction.

LED Communications Indicator. The host control can be selected to pulse each appliance's LED when it receives a supervision poll. This feature can be left on continuously, or activated for system testing.

Silent Mode Appliance Magnet Testing. In this test mode, the local magnet test activates the appliance LED to pulse sequentially to indicate the appliance's address *and* to indicate the appliance's strobe intensity selection.

Operational (non-silent mode) Appliance Magnet Test. When this test mode is selected at the host control, after the address and intensity selection is indicated, the strobe will flash once to indicate proper operation.

4100U TrueNAC Diagnostic Operation

Individual Appliance Performance Analysis. With appliances on the SLC activated, each appliance measures its terminal voltage and reports it to the 4100U TPS where its address and appliance type is stored in memory. The 4100U TPS measures its output voltage and current and then iteratively analyzes all of this information against known appliance power requirements to determine equivalent impedance to each appliance. TrueNAC diagnostics then analyze each appliance's wiring connection for performance under worst case conditions and identifies problems by appliance address.

TrueAlert Device Reports detail type, candela rating, and location per appliance (first sample below). Fixed candela appliances will also report, but are not compatible with TrueNAC voltage drop diagnostics.

TrueNAC Status Reports detail the diagnostic results as shown in the second report example below.

Product Selection

Multi-Candela Addressable Strobe

Model	Mounting	Housing Color	"FIRE" Lettering	Dimensions	Description
4906-9201	Wall	Red	White	5-1/8" H x 5" W x 2-3/4" D (130 mm x 127 mm x 70 mm)	Multi-Candela Addressable Strobe; intensity selectable as: 15, 30, 75, or 110 candela
4906-9203		White	Red		
4906-9202	Ceiling	Red	White	4-3/4" x 2-5/16" x 2-5/8" D (121 mm x 75 mm x 67 mm)	
4906-9204		White	Red		

V/O Adapters (see diagram on page 4)

Model	Description	Dimensions
4905-9937	Red Wall Mount, Surface Mount Adapter Skirt; use to cover 1-1/2" (38 mm) deep surface mounted boxes	5-3/8" H x 5-1/4" W x 1-5/8" D (136 mm x 133 mm x 41 mm)
4905-9940	White Wall Mount, Surface Mount Adapter Skirt; use to cover 1-1/2" (38 mm) deep surface mounted boxes	depth with strobe = 4-3/8" (111 mm)
4905-9931	Wall Mount, Red Adapter Plate for mounting to Simplex 2975-9145 box (typically for retrofit, may be mounted vertical or horizontal)	8-5/16" x 5-3/4" x 0.060" Thick (211 mm x 146 mm x 1.5 mm)
2975-9145	Wall Mount, Red Mounting Box, requires Adapter Plate 4905-9931	7-7/8" x 5-1/8" x 2-3/4" D (200 mm x 130 mm x 70 mm)
4905-9910	Ceiling Mount, Surface Mount Adapter Plate, zinc plated; required for ceiling surface mount	4-7/8" x 3-1/8" (124 mm x 79 mm)

Replacement Covers for Wall Mount Strobes

Model	Description	Dimensions
4905-9992	Red cover with white "FIRE" lettering	5-1/8" H x 5" W x 1-1/2" D (130 mm x 127 mm x 38 mm)
4905-9993	White cover with red "FIRE" lettering	

Wire Guards (see diagram on page 4)

Model	Description	Dimensions
4905-9961*	Wall Mount Red wire guard with mounting plate, compatible with semi-flush or surface mounted boxes	6-1/16" H x 6-1/16" W x 3-1/8" D (154 mm x 154 mm x 79 mm)
4905-9926*	Ceiling Mount	6-1/8" x 4-3/8" x 2-7/8" (156 mm x 111 mm x 73 mm)

* UL listed by Space Age Electronics Inc.

Addressable V/O Specifications

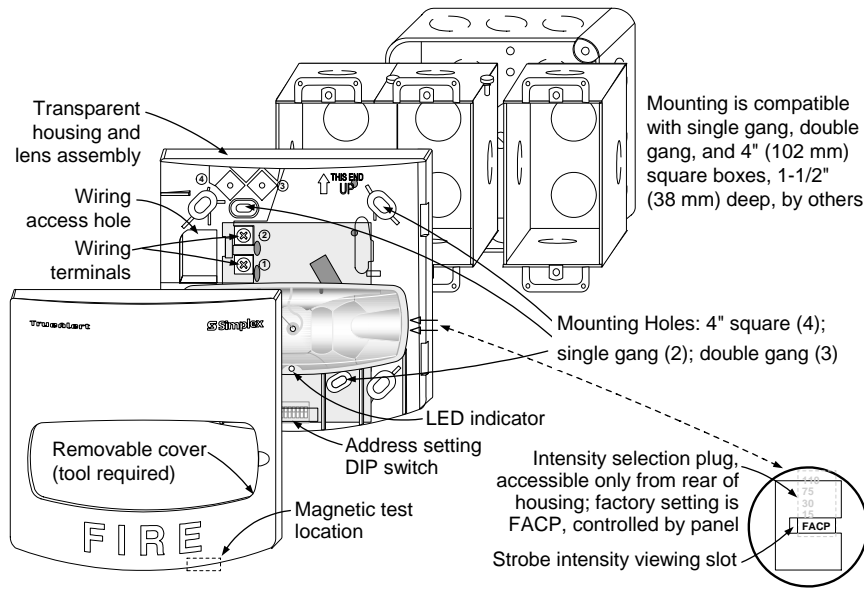
Wall Mount or Ceiling Mount, Common Specifications

Rated Voltage Range	UL Listed Rating	Special Application, 17 to 31 VRMS, see Note 1 below			
	ULC Listed Rating	21.25 to 28.2 VRMS			
Supervisory Requirements	1 unit load				
Strobe Flash Rate and SLC Loading	1 Hz; with up to 46 synchronized addressable strobes maximum per SLC				
Environmental; Temperature and Humidity	32° to 122° F (0° to 50° C); 10% to 93%, non-condensing at 100° F (38° C)				
Terminal Block Connections	18 AWG to 12 AWG (0.82 mm ² to 3.31 mm ²); 2 wires per terminal for in/out wiring				
Wall Mount Current	Housing Dimensions (with lens)	5-1/8" H x 5" W x 2-3/4" D (130 mm x 127 mm x 70 mm)			
	Maximum RMS Current Rating per Strobe Intensity (see Note 2)	15 cd	30 cd	75 cd	110 cd
		64 mA	98 mA	187 mA	253 mA
	RMS Currents at other voltages (Reference)	18 VRMS	60 mA	93 mA	177 mA
24 VRMS		45 mA	69 mA	132 mA	179 mA
Ceiling Mount Current	Housing Dimensions (with lens)	4-3/4" x 2-5/16" x 2-5/8" D (121 mm x 75 mm x 67 mm)			
	Maximum RMS Current Rating per Strobe Intensity (see Note 2)	15 cd	30 cd	75 cd	110 cd
		76 mA	128 mA	242 mA	328 mA
	RMS Currents at other voltages (Reference)	18 VRMS	72 mA	121 mA	229 mA
24 VRMS		54 mA	91 mA	171 mA	232 mA

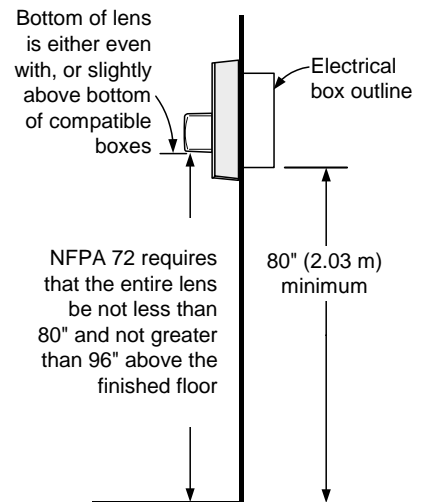
NOTES:

- "Special Application" refers to the operating category under UL Standard 1971, *Signaling Devices for the Hearing Impaired*. The rated voltage range listed is the absolute operating range. Operation outside of this range may cause permanent damage to the appliance. Please note that 17 VRMS is the lowest operating voltage that is allowed at the last appliance on the TrueAlert signaling line circuit under worst case conditions.
- The maximum RMS current listed is the appliance nameplate rating. Strobe designs are constant wattage and the maximum RMS current rating occurs at the lowest allowable operating voltage.

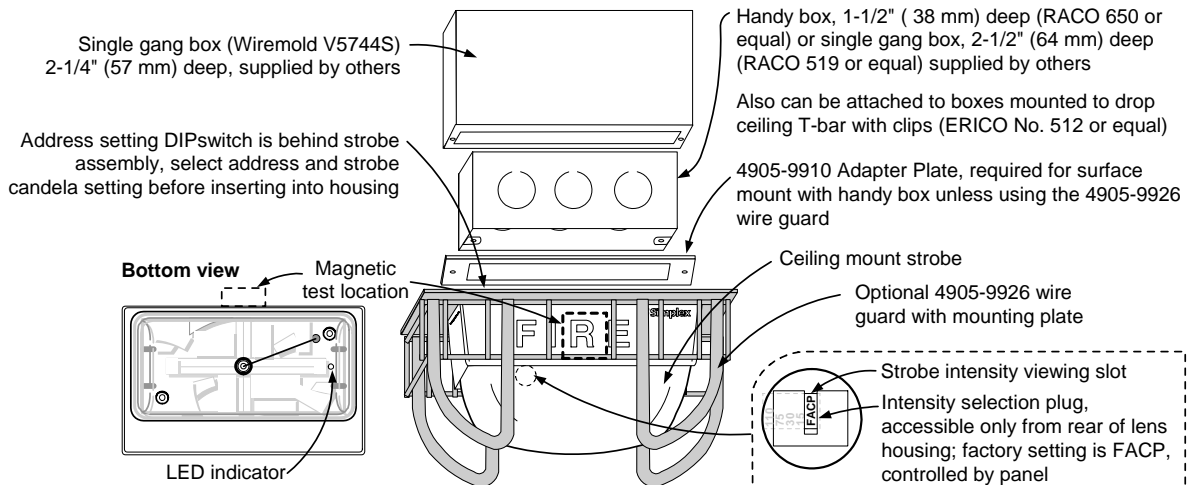
Wall Mount Installation Reference, Surface or Semi-Flush Mounting



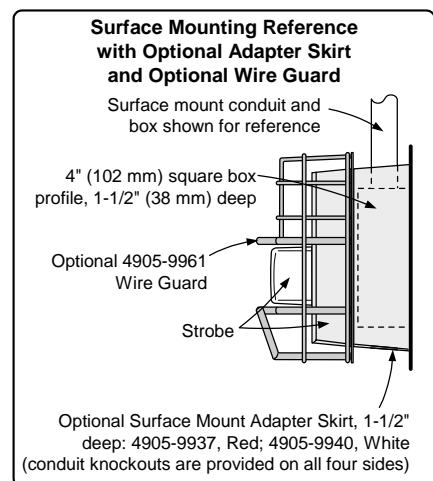
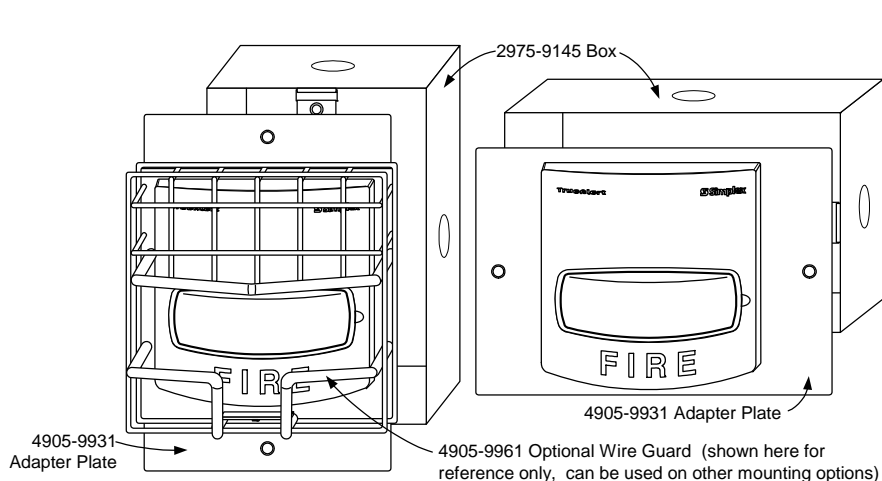
IMPORTANT! WALL MOUNT INSTALLATION HEIGHT REFERENCE



Ceiling Mount V/O and Guard Installation Reference



Wall Mount Installation Reference; Adapter Plate, Guard, and Adapter Skirt



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Features

Individually addressed and controlled multi-candela S/V (speaker/visible) notification appliances provide:

- High intensity multi-candela xenon strobe with intensity *programmable from a Simplex® 4100ES/4100U fire alarm control panel with TrueAlert Addressable Power Supply (TPS)* or jumper selected as 15, 30, 75, or 110 cd
- Synchronized 1 Hz strobe flash rate
- Wiring supervision to each strobe allowing “T-tapped” connections for Class B circuits to simplify wiring (Class A circuits require in/out wiring)
- Backwards compatibility with fixed candela TrueAlert addressable strobes on same Signaling Line Circuit (SLC) allowing convenient expansion and replacement
- Compatibility with ADA requirements; (refer to important installation information on page 4)
- UL listed to Standard 1971 and ULC S526

Compatible TrueAlert Addressable Host Controls:

- *TrueAlert Addressable Power Supply (TPS)* mounted in the control panel or in a remote cabinet
- *TrueAlert Addressable Controller (4009T)* interface panel

With multi-candela appliances and 4100ES/4100U fire alarm control panels with TPS, TrueNAC voltage drop diagnostics provide:

- *Individual appliance voltage drop analysis* using appliance intensity selection, measured appliance voltage, and SLC output voltage and current
- *Device Reports* that detail type, candela rating, and location of addressable appliances on the SLC (*also available with TrueAlert Addressable Controller connected to 4100ES/4100U using RUI communications*)
- *Status Reports* that list the diagnostic results per appliance on the SLC (see details on page 2)
- Requires 4100ES, or 4100U with Software Revision 12.04 or higher and compatible TPS version

LED indicator and magnet test feature:

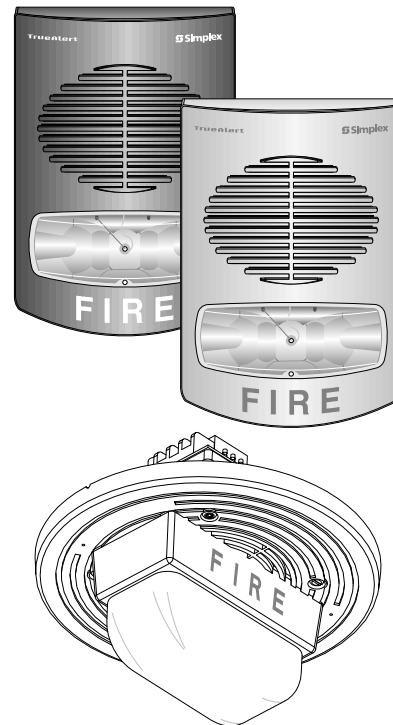
- Appliance LED can be selected to display each polling cycle to indicate appliance supervision
- In diagnostic mode, the magnet test pulses the LED to indicate appliance address **AND pulses to indicate the intensity selection**; a brief output of the strobe is also selectable to confirm operation

Mechanical design features:

- Rugged, high impact, flame retardant thermoplastic housings are available for wall or ceiling mount
- Wall mount housings are available in red or white
- Wall mount options include electrical box adapters, separate covers to convert color, and red wire guards
- Ceiling mount housing is white

Audible notification appliance (speaker):

- High quality voice and tone reproduction with taps for 1/4, 1/2, 1, or 2 W, at 25 or 70.7 VRMS
- Speakers have capacitor input for connection to DC supervised NACs and are wired separately from strobes
- UL listed to Standard 1480 and ULC S541*



Wall and Ceiling Mount S/Vs with Addressable Strobes

Description

Multi-Candela TrueAlert S/Vs with speaker and addressable strobe provide convenient installation to standard electrical boxes with extensions. The strobe is individually addressed and individually controlled with power, supervision, and control supplied from a TrueAlert Addressable SLC. Speakers are wired separately.

4100ES/4100U Additional Features. When controlled from a Simplex 4100ES/4100U control panel with TPS, additional features are available such as software selection of strobe intensity, detailed reports of actual appliance intensity selection (see sample reports on page 2), TrueNAC voltage drop diagnostics, and additional setup and test diagnostics (further detailed on page 2).

Strobe Intensity Selection

Selectable at Appliance or Remotely Selected. During installation, a plug at the back of the housing (visible after installation) is inserted to select strobe output as 15, 30, 75, or 110 cd; **or FACP.** *FACP is the factory default setting and allows a 4100ES/4100U control panel with TPS to program the output intensity.*

* See page 3 for additional listing details and wire guard listings. 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 7320-0026:322 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. 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.

Strobe Intensity Selection

FACP Selection Advantages. When intensity is selected in software from a 4100ES/4100U fire alarm panel, it can be easily changed if renovations or other usage conditions are revised, and intensity selection errors at installation are effectively eliminated.

Strobe Application Reference

Proper selection of visible notification is dependent on occupancy, location, local codes, and proper applications of: the *National Fire Alarm and Signaling Code* (NFPA 72), ANSI A117.1; the appropriate model building code: BOCA, ICBO, or SBCCI; and the application guidelines of the Americans with Disabilities Act (ADA).

TrueAlert Addressable Advantage

TrueAlert Addressable Operation provides visible appliance control functions that also *confirms connection to the individual notification appliance's electronic circuit*. This operation increases circuit supervision integrity by providing supervision that extends beyond the appliance wiring connections.

Opportunities for Reducing Installation and Testing Time. When Class B (Style 4) wiring is used, *strobe wiring can be T-tapped*, allowing savings in distance, wire, junction boxes, and overall installation efficiency. In addition, TrueNAC diagnostics further improve installation efficiency by analyzing individual strobe wiring connections.

TrueAlert Addressable Diagnostics

Appliance Type and Intensity Check. The TrueAlert Addressable Host Control is programmed with address, location, device type, and intensity selection. An incorrect

TrueAlert Addressable Diagnostics (Cont'd)

appliance replacement or substitution will produce a location specific trouble allowing easy correction.

LED Communications Indicator. The host control can be selected to pulse each appliance's LED when it receives a supervision poll. This feature can be left on continuously, or activated for system testing.

Silent Mode Appliance Magnet Testing. In this test mode, the local magnet test activates the appliance LED to pulse sequentially to indicate the strobe's address *and* to indicate the strobe's intensity selection.

Operational (non-silent mode) Appliance Magnet Test. When this test mode is selected at the host control, after the address and intensity selection is indicated, the strobe will flash once to indicate proper operation.

4100ES/4100U TrueNAC Diagnostic Operation

Individual Appliance Performance Analysis. With appliances on the SLC activated, each appliance measures its terminal voltage and reports it to the TPS where its address and appliance type is stored in memory. The TPS measures its output voltage and current and then iteratively analyzes all of this information against known appliance power requirements to determine equivalent impedance to each appliance. TrueNAC diagnostics then analyze each appliance's wiring connection for performance under worst case conditions and identifies problems by appliance address.

TrueAlert Device Reports detail type, candela rating, and location per appliance (first sample below). Fixed candela appliances will also report, but are not compatible with TrueNAC voltage drop diagnostics.

TrueNAC Status Reports detail the diagnostic results as shown in the second report example below.

TrueAlert Device and Device Status Reports

Service Port		Page 1	
REPORT 5 : TrueAlert Device Report		12:34:56am	MON 11-Feb-13
POINT ID	CUSTOM LABEL	DEVICE TYPE	CANDELA
T14-1-1	Location Label . . . up to 40 characters	V/O	15
T14-1-2	Break Room 5	S/V	110
T14-1-3	Boiler Room	S/V	75
T14-1-4	Elec. Room 7	S/V	30

Service Port		Page 1	
REPORT 6 : TrueNAC Status Report		12:34:56am	MON 11-Feb-13
TPS AT ADDRESS 3			
SLC 1			
POINT ID	CUSTOM LABEL	TEST RESULT	
T14-1-1	Location Label . . . up to 40 characters	PASSED	
T14-1-3	West Hall South End	PASSED	
T14-1-5	Classroom 2	PASSED	
T14-1-6	Classroom 3	FAILED -0.6	
NOMINAL CURRENT (A) :		1.34	
WORST CASE CURRENT (A) :		1.97	
WORST CASE VOLTAGE ABOVE/BELOW THRESHOLD (V) :		-0.6	
SLC HAS NOT PASSED UNLESS ALL DEVICES ARE MARKED AS PASSED			

Addressable Product Reference

Product	Data Sheet	Product	Data Sheet	Product	Data Sheet
V/O (strobe)	S4906-0004	TrueAlert Addressable Horn	S4901-0012	4100ES Fire Alarm Panels	S4100-0031
A/V (speaker/strobe)	S4906-0005	Amber Lens Strobes (Mass Notification)	S4906-0007		
TrueAlert Isolator	S4905-0001	TrueAlert Addressable Controller (4009T)	S4009-0003		

Product Selection

Multi-Candela Addressable S/Vs

Model	Lettering	Housing Color	Mounting	Dimensions	Description
4906-9251	White FIRE	Red	Wall	7-1/4" H x 5" W x 2-5/8" D (184 mm x 127 mm x 67 mm)	Multi-Tapped Speaker with Multi-Candela Addressable Strobe; intensity selectable as: 15, 30, 75, or 110 candela * Ceiling mount models are not ULC listed
4906-9253	Red FIRE	White			
4906-9254*	Red FIRE	White	Ceiling	7-1/2" (191 mm) diameter speaker housing, 1/2" (13 mm) deep; lens extends 2-5/8" (67 mm) above housing; extension into box = 2-3/4" (70 mm)	
4906-9255*	Blank				
4906-9256*	Red ALERT				

Wall Mount S/V Adapters, Replacement Covers, Wire Guard; Ceiling Mount Tile Bridge

Model	Description	Dimensions
4905-9946	Surface Mount Red Adapter Skirt	7-3/4" H x 5-3/8" W x 3-3/16" D (197 mm x 137 mm x 81 mm) depth with S/V = 5-7/8" (149 mm)
4905-9947	Surface Mount White Adapter Skirt	
4905-9903	Adapter Plate, red, required to mount S/V on 2975-9145 mounting box (typically for retrofit)	8-5/16" H x 5-3/4" W x 0.060" Thick (211 mm x 146 mm x 1.5 mm)
2975-9145	Mounting Box, red, for surface or flush mount, requires adapter plate 4905-9903 (this box may be available for retrofit applications)	7-7/8" H x 5-1/8" W x 2-3/4" D (200 mm x 130 mm x 70 mm)
4905-9996	Red Wall Mount S/V Replacement Cover with white "FIRE" lettering	7-1/4" H x 5" W x 1-3/8" D (184 mm x 127 mm x 35 mm)
4905-9997	White Wall Mount S/V Replacement Cover with red "FIRE" lettering	
4905-9998	Red Wire Guard for Wall Mount S/V; with mounting plate, compatible with surface and semi-flush boxes (UL listed by Space Age Electronics Inc.)	8-3/8" H x 6-1/16" W x 3-1/4" D (213 mm x 154 mm x 79 mm)
2905-9946	Tile Bridge for Ceiling Mount S/Vs	See diagram on page 4

S/V Specifications (refer to Installation Instructions 579-808 for more information)

Common Specifications	Environmental	32° to 122° F (0° to 50° C); 10% to 93%, non-condensing at 100° F (38° C)				
	Connections	Terminal blocks for 18 AWG to 12 AWG (0.82 mm ² to 3.31 mm ²); two wires per terminal for in/out wiring				
Speaker Specifications	Input Voltage	25 or 70.7 VRMS, see Note 1 below				
	Power Taps	1/4, 1/2, 1, and 2 W				
	Frequency Response	Fire Alarm	400 to 4000 Hz			
	General Signaling	125 to 12 kHz				
Speaker Output Ratings @ 10 ft (3 m) (see Note 1 below)	Wattage Tap	1/4 W	1/2 W	1 W	2 W*	
	All Models Reverberant Chamber, UL 1480 Test	76 dBA	79 dBA	82 dBA	85 dBA	
	Wall mount models only, Anechoic Chamber Test, per ULC S541	77 dBA	80 dBA	83 dBA	86 dBA	
	All Models, Anechoic Chamber, 1 kHz Input, On-Axis	87 dBA	90 dBA	93 dBA	96 dBA	
Polar Dispersion Reference (per ULC S541 Anechoic Chamber Testing)	Attenuation	-3 dB	Angle	+/- 30° off-axis	Attenuation	Angle
					-6 dB	+/- 55° off-axis

* NOTE: ULC Fire Alarm applications require use of 2 W tap to meet minimum of 85 dBA.

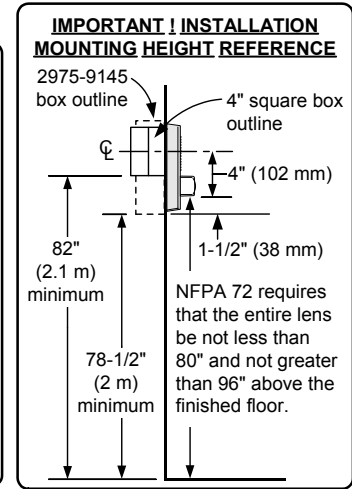
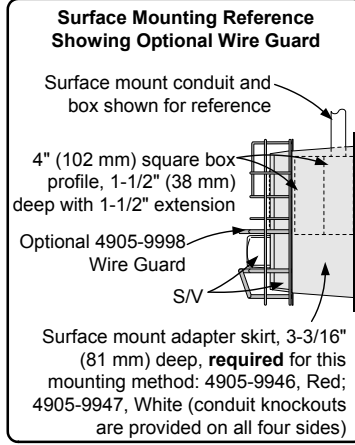
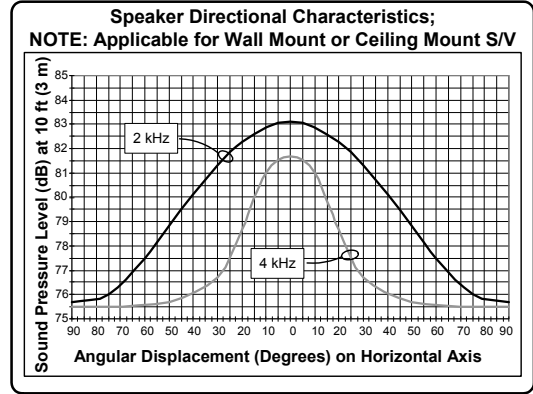
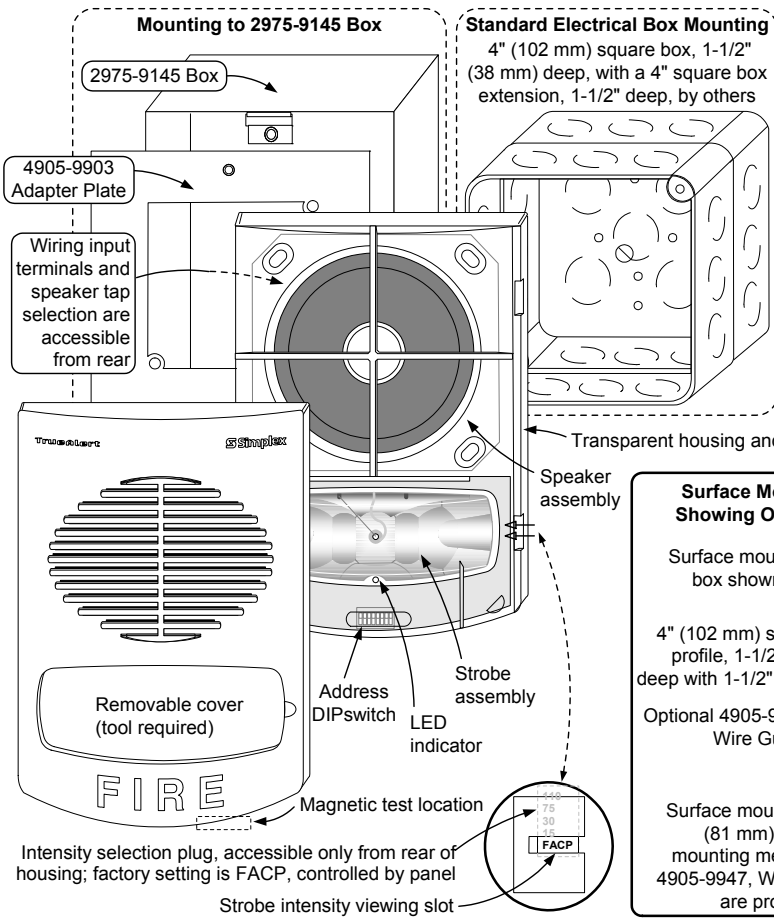
Strobe Specifications

Rated Voltage Range	UL Listed Rating	Special Application, 17 to 31 VRMS, see Note 2 below			
	ULC Listed Rating	21.25 to 28.2 VRMS			
Flash Rate and Synchronized SLC Loading		1 Hz; with up to 46 synchronized strobes maximum per NAC			
Wall Mount Current	Housing Dimensions (with lens)	7-1/4" H x 5" W x 2-5/8" D (184 mm x 127 mm x 67 mm)			
	Maximum RMS Current Rating per Strobe Setting (see Note 3 below)	15 cd	30 cd	75 cd	110 cd
		64 mA	98 mA	187 mA	253 mA
	Reference RMS Currents at other voltages	18 VRMS	60 mA	93 mA	177 mA
24 VRMS		45 mA	69 mA	132 mA	179 mA
Ceiling Mount Current	Housing Dimensions	Speaker housing = 7-1/2" (191 mm) diameter, 1/2" deep (13 mm); lens protrusion above speaker housing = 2-5/8" (67 mm); depth into box = 2-3/4" (70 mm)			
	Maximum RMS Current Rating per Strobe Setting (see Note 3 below)	15 cd	30 cd	75 cd	110 cd
		76 mA	128 mA	242 mA	328 mA
	Reference RMS Currents at other voltages	18 VRMS	72 mA	121 mA	229 mA
24 VRMS		54 mA	91 mA	171 mA	232 mA

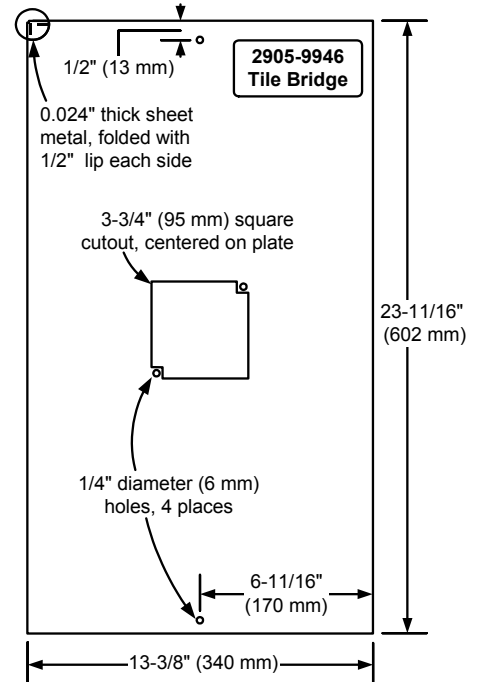
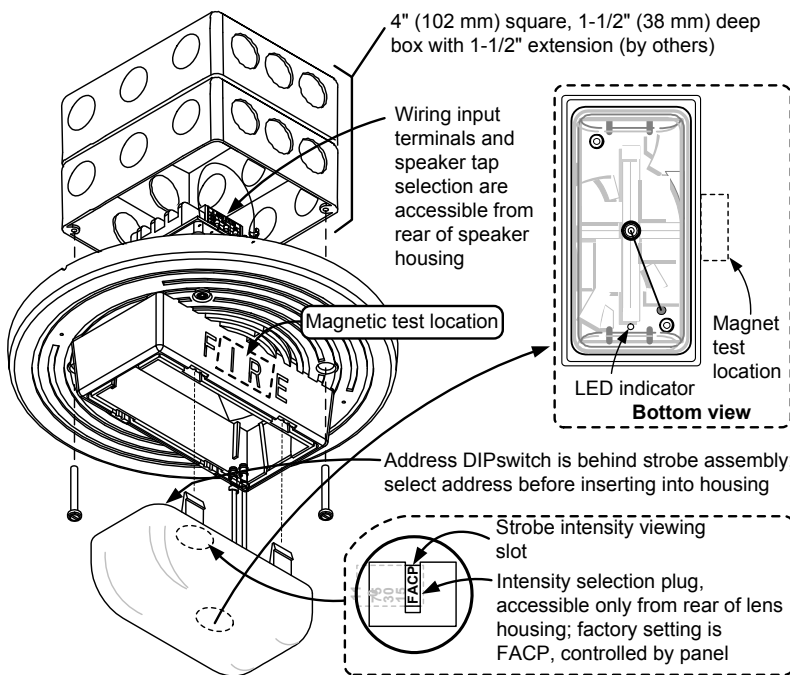
NOTES:

- Speakers are for connection to conventional fire alarm audio circuits. Anechoic speaker output ratings are typically more representative of actual installed sound output.
- "Special Application" refers to the operating category under UL Standard 1971, *Signaling Devices for the Hearing Impaired*. The rated voltage range listed is the absolute operating range. Operation outside of this range may cause permanent damage to the appliance. Please note that 17 VRMS is the lowest operating voltage that is allowed at the last appliance on the TrueAlert signaling line circuit under worst case conditions.
- The maximum RMS strobe current listed is the device nameplate rating. Strobe designs are constant wattage and the maximum RMS current rating occurs at the lowest allowable operating voltage.

Wall Mount Installation Reference



Ceiling Mount S/V Install Reference and Tile Bridge Dimensions



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Features

Fire alarm speakers with models for ceiling or wall mount:

- Four inch cone (102 mm) provides high quality tone and voice reproduction
- Multi-tapped design provides output power of 1/4, 1/2, 1, or 2 W with either 25 or 70.7 VRMS input
- In/out wiring terminals for 18 AWG to 12 AWG
- Mounts to 4" square outlet box, 1-1/2" deep with 1-1/2" deep box extension
- Capacitor input for connection to supervised notification appliance circuits
- Rugged, high impact, flame retardant thermoplastic housings
- UL listed to Standard 1480
- ULC listed to Standard S541, refer to page 4 for required minimum wattage tap per housing type

Rectangular housing models feature:

- Appearance that complements TrueAlert® strobes and speaker/strobes
- Red or white housings with "FIRE" lettering for surface or semi-flush wall mount
- Optional matching adapter skirts for covering surface mounted electrical boxes*
- Optional red wire guard

Round housing models feature:

- Off-white color (no lettering) for flush mount on ceiling or wall
- Compatible with optional tile bridge 2905-9946

Introduction

Simplex® 4902 Series speakers provide high quality sound for emergency fire alarm use as well as for background music. The moisture-repellent speaker is designed for smooth frequency response with minimal distortion.

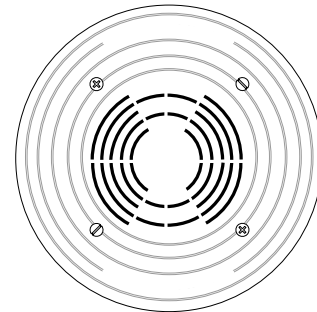
The multi-tapped speaker transformer accommodates either 25 or 70.7 VRMS and provides an output of from 1/4 to 2 W to provide flexibility for satisfying the requirements of the installed conditions.

Rectangular housing models are for surface or semi-flush wall mount applications. Round housing models are typically for ceiling applications but can be wall mounted if desired. The rectangular housing speakers are designed to compliment the TrueAlert family of strobes and speaker/strobes, providing conventional, non-addressable speaker operation.

* Refer to page 2 for guard and adapter skirt listing. 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 7320-0026:242 for allowable values and/or conditions concerning material presented in this document. It is subject to re-examination, revision, and possible cancellation. 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 Safety Products Westminster.



Rectangular Wall Mount Speakers are Available as Red with White "Fire" Lettering and White with Red "Fire" Lettering



Round Speakers are Available in Off-White (no lettering)

Specifications

Dimensions, Rectangular Wall Mount Housings

Housing Dimensions	5-1/8" H x 5" W x 1-1/2" D (130 mm x 127 mm x 38 mm)
Depth into Box	2-3/4" (70 mm)

Dimensions, Round Housings

Housing Dimensions	7-1/2" Diameter, 1/2" D (191 mm x 13 mm)
Depth into Box	2-3/4" (70 mm)

General Specifications

Input Voltage	25 or 70.7 VRMS	
Power Taps	1/4, 1/2, 1, and 2 W	
Input Terminal Ratings	18 to 12 AWG (0.82 mm ² to 3.31 mm ²)	
Frequency Response	Fire Alarm	400 to 4000 Hz
	General Signaling	125 to 12 kHz
Sound Output	See information on page 4	
Temperature Range	32° to 100° F (0° to 38° C)	
Humidity Range	10% to 95% RH from 32° to 122° F (0° to 50° C)	

Product Selection

Speakers

Model*	Description		Dimensions
4902-9716 (CA)	Rectangular housing, wall mount speaker	Red with white "FIRE" lettering	5-1/8" H x 5" W x 1-1/2" D (130 mm x 127 mm x 38 mm)
4902-9717 (CA)		White with red "FIRE" lettering	
4902-9721 (CA)	Round housing speaker, ceiling or wall mount	Off-white (no lettering)	7-1/2" Diameter x 1/2" D (191 mm x 13 mm)

* ULC listed model are designated with a CA suffix (4902-9716CA). Refer to Installation Instructions 574-765 for non-suffix model numbers and to Installation Instructions 579-324 for CA suffix model numbers.

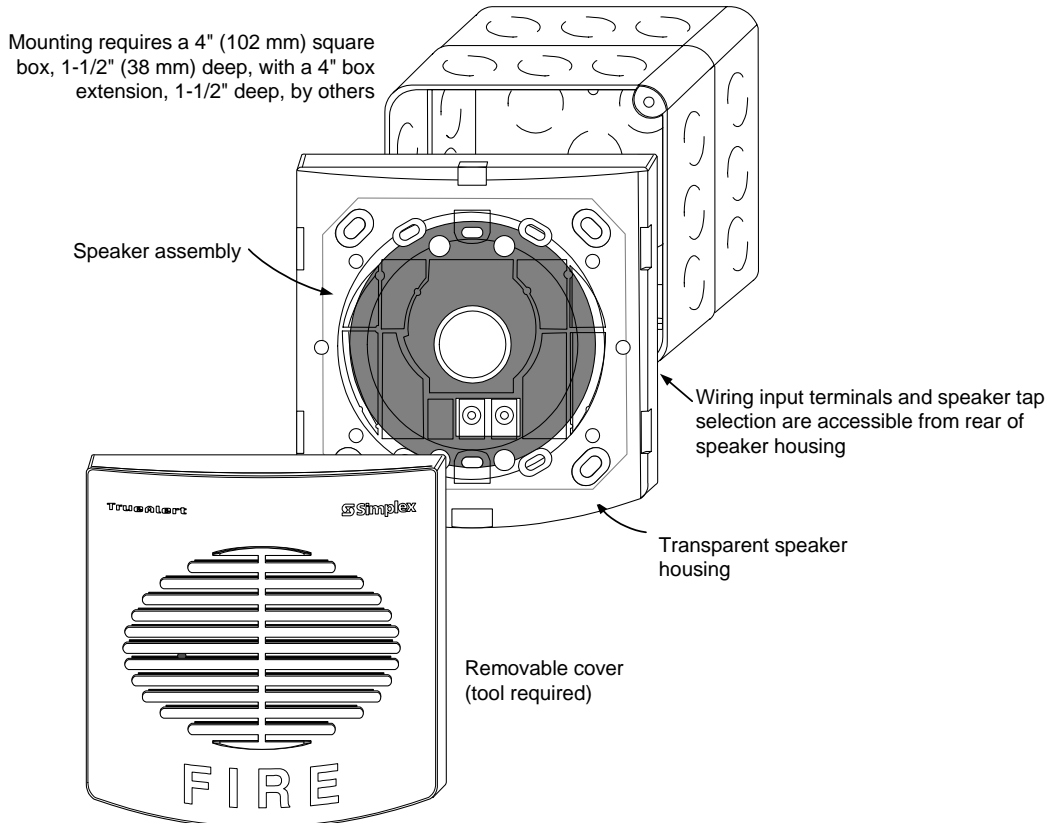
Mounting Adapters

Model	Description		Dimensions
4905-9941	Red	Surface mount adapter skirt; (not ULC listed)	Use to cover surface mounted 1-1/2" deep box with 1-1/2" deep extension external to wall (see diagram on page 3)
4905-9942	White		
2905-9946	Tile bridge for 4902-9721 Speaker		See diagram on page 3
4905-9931	Adapter Plate, red, for mounting to 2975-9145 box (typically for retrofit, may be mounted vertical or horizontal)		8-5/16" x 5-3/4" x 0.060" Thick (211 mm x 146 mm x 1.5 mm)
2975-9145	Red mounting box, requires Adapter Plate 4905-9931		7-7/8" x 5-1/8" x 2-3/4" D (200 mm x 130 mm x 70 mm)

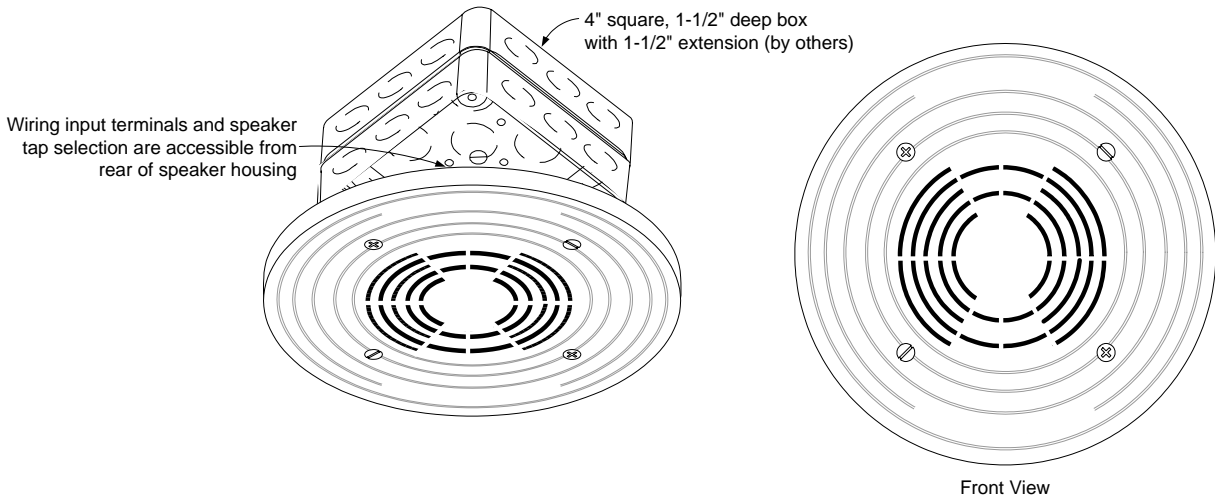
Covers and Guard

Model	Description		Dimensions
4905-9988	Red speaker cover with white "FIRE" lettering	Interchangeable with TrueAlert horns	5-1/8" H x 5" W x 1-1/2" D (130 mm x 127 mm x 38 mm)
4905-9989	White speaker cover with red "FIRE" lettering		
4905-9999	Red wire guard with mounting plate; compatible with semi-flush or surface mounted boxes; for use with 4" square electrical box mounting hole patterns only (UL listed by Space Age Electronics Inc.)		6-1/16" H x 6-1/16" W x 3-1/8" D (154 mm x 154 mm x 79 mm)

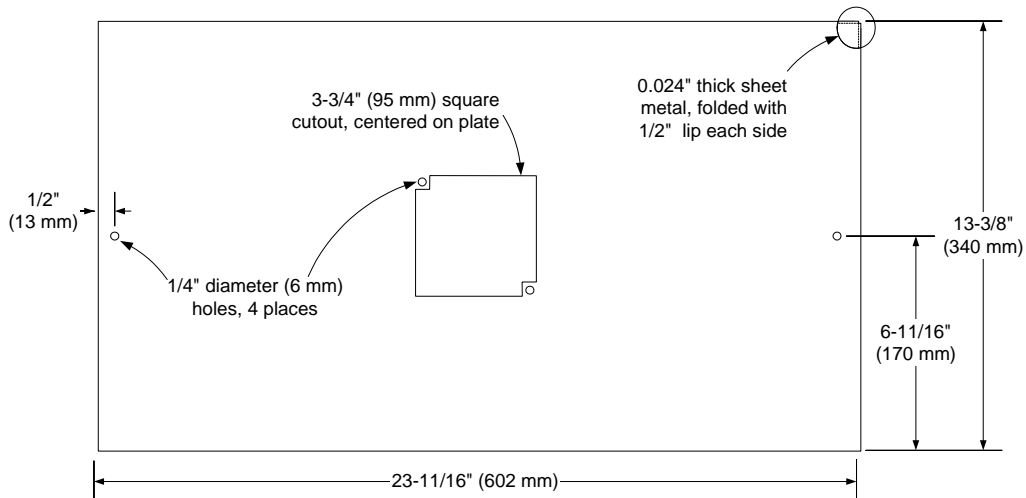
Wall Mount Speakers, Installation Reference



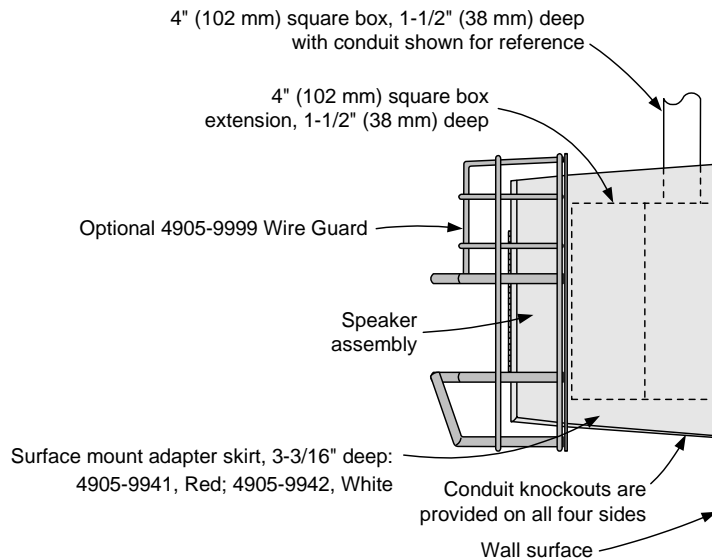
Round Speaker Installation Reference (typically ceiling mount, can be wall mounted)



2905-9946 Tile Bridge Dimensions



Surface Mounted Speaker Reference (Adapter Skirts are *Not ULC listed*)



Speaker Sound Output Specifications

Sound Output Ratings @ 10 ft (~3 m) per UL 1480 Reverberant Chamber Testing

Model	Type	Input Voltage	Selected Tap			
			1/4 W	1/2 W	1 W	2 W
4902-9716 4902-9717	Rectangular Housing	25 VRMS	80 dBA	83 dBA	85 dBA	88 dBA
		70.7 VRMS	79 dBA	82 dBA	85 dBA	88 dBA
4902-9721	Round Housing	25 or 70.7 VRMS	79 dBA	82 dBA	85 dBA	88 dBA

Sound Output Ratings @ 3 m (~10 ft) per ULC S541 Anechoic Chamber Testing

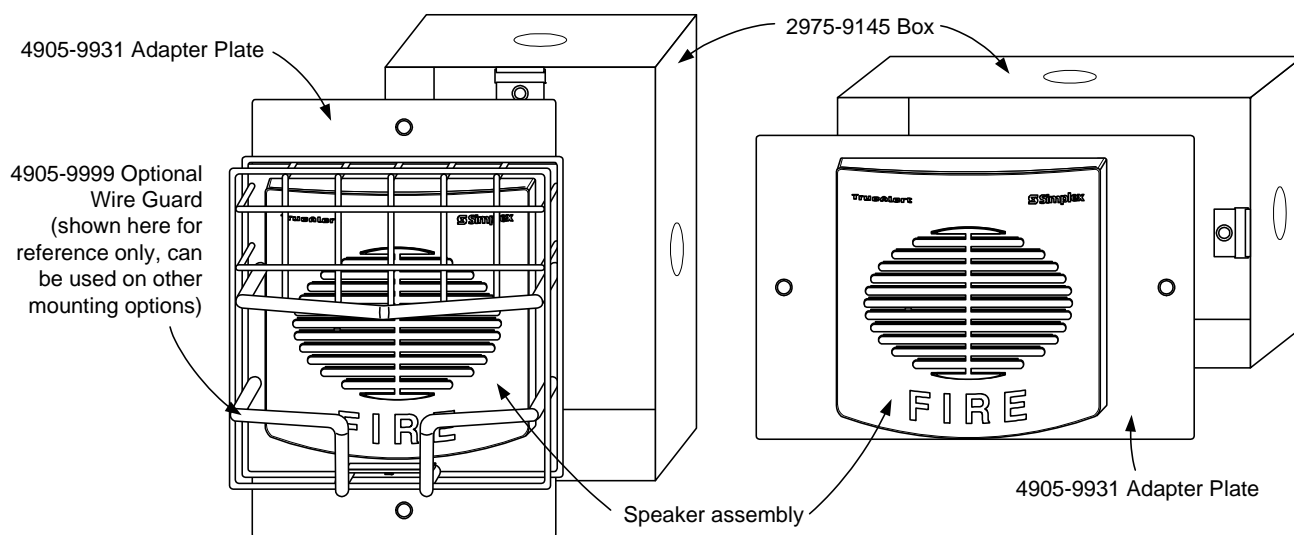
Model	Type	Input Voltage	Selected Tap			
			1/4 W	1/2 W	1 W* (see note)	2 W* (see note)
4902-9716CA 4902-9717CA	Rectangular Housing*	25 VRMS or 70.7 VRMS	77 dBA	80 dBA	83 dBA	86 dBA
4902-9721CA	Round Housing*	25 VRMS or 70.7 VRMS	79 dBA	82 dBA	85 dBA	89 dBA

* NOTE: ULC Fire Alarm applications require use of 1 W or 2 W tap for Round Housing speakers; and 2 W tap for Rectangular Housing speakers.

Speaker Polar Dispersion Reference (per ULC S541 Anechoic Chamber Testing)

Attenuation	Angle
-3 dB	30° off-axis
-6 dB	55° off-axis

4905-9931 Adapter Plate Installation Reference



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