

## Introduction

The 4603-9101 Liquid Crystal Display (LCD) annunciator is for use with 4100ES, 4100U, 4100, 4120, 4020 Fire Alarm Control Unit (FACUs), and 4100/4120 Universal Transponders. Only the 4100U/4100ES systems are UL864, 9th Edition compliant. All other panels listed are for retrofit only.

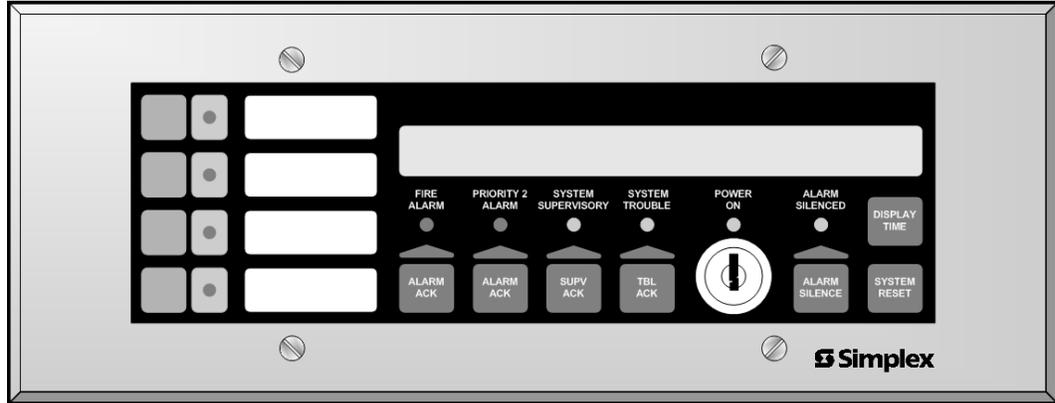


Figure 1. 4603-9101 LCD Annunciator

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## Cautions and Warnings



**READ AND SAVE THESE INSTRUCTIONS** - Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depend upon proper installation.

**DO NOT INSTALL ANY SIMPLEX® PRODUCT THAT APPEARS DAMAGED** - Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify an authorized Simplex product supplier.



**ELECTRICAL HAZARD** - Disconnect electrical field power when making any internal adjustments or repairs. All repairs should be performed by a representative or authorized agent of your local Simplex product supplier.



**STATIC HAZARD** - Static electricity can damage components. Handle as follows:

- Ground yourself before opening or installing components.
- Prior to installation, keep components wrapped in anti-static material at all times.

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## Specifications

**Table 1: Power requirements and environmental limitations**

<b>Voltage</b>	24VDC Power Supply.	24VDC Nominal.
<b>Current</b>	Maximum Current Draw.	with LCD Backlight OFF at 24VDC: 65mA.
	Maximum Current Draw.	with LCD Backlight ON at 24VDC: 110mA.
	Maximum Current Draw.	with LCD Backlight ON and Piezo ON at 18VDC: 140mA.
<b>Temperature</b>	Operating Range.	32°F to 120°F (0°C to 49°C).
<b>Humidity</b>	The equipment operates normally under non-condensing humidity conditions up to 93% relative humidity at 100°F (38°C).	

- All circuits are power-limited if the operating power and communications are provided by a 4020 control unit, or by a system with the 4100/4120-6050 power-limited option.
- If the interconnected control unit is not used to provide operating power to the annunciator, use a regulated UL-listed 24VDC power supply for fire protective signaling.
- At least an 18 AWG twisted wire is required. If twisted-shielded pair wire is used, ground the shield at the main panel.
- Center the conduit entry a minimum of 2¾ in/70mm from the front of the box.
- Ensure the number of annunciators in a 4100ES/4100U/4100+ fire alarm system does not exceed 31.
- Do not use the 4603-9101 LCD Annunciator when the 4100ES/4100U/4100+ control panel is configured for proprietary receiving service.
- In accordance with NFPA 70, Article 250, provide a dedicated earth ground connection to the back box for transient suppression.

### Flush-mount 4603-9101 LCD annunciators

- In masonry walls, use a Steel City GW-635-G (3½ in/89mm deep) masonry box, or an equivalent box.
- In plasterboard walls, use a RACO 590 (3½ in/89mm deep) gangable switch box with conduit entry, or an equivalent box.

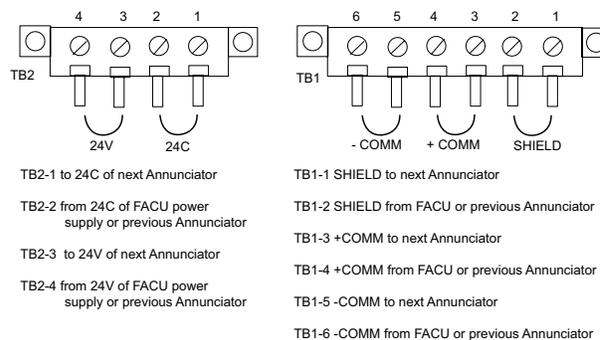
### Surface mount 4603-9101 LCD annunciators

- Use a 2975-9206 box (2¾ in/70mm deep) or a 2975-9217 box (1¾ in/44.45 mm deep).

## Installing the 4603-9101 LCD Annunciator

Complete the following steps to install the 4603-9101 LCD annunciator. Refer to the *Field Wiring Diagram* manual 841-731 for additional details.

1. Terminate the annunciator's COMM and power lines as shown in Figure 2.



**Figure 2. Terminating the COMM and power lines**

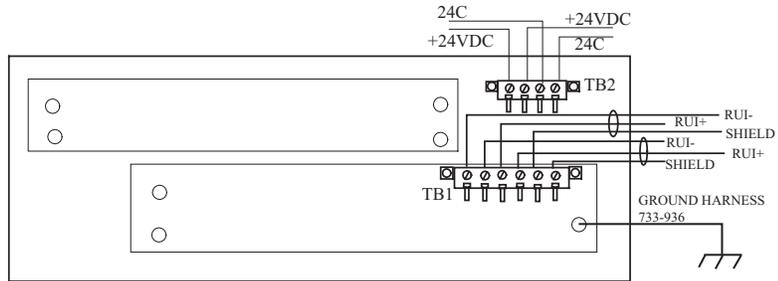
2. Connect the ground harness (733-936) to earth ground.

**Note:** To prevent Electrostatic Discharge (ESD), use a wrist strap assembly that connects to ground. Ensure the power is OFF before installing or servicing the annunciator. Terminate the annunciator's power and communication lines on the electronics assembly using the information in Figure 2.

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## Installing the 4603-9101 LCD Annunciator

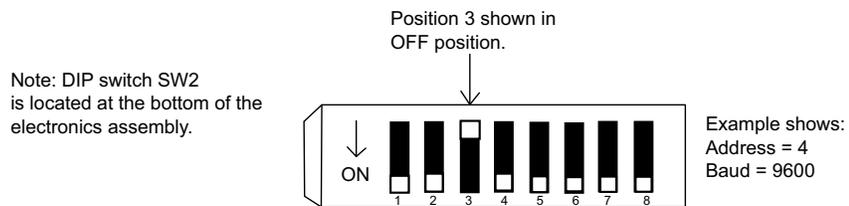


**Figure 3. Power and RUI communicating Wiring to TB1 and TB2**

- Using switch SW2, see Figure 4, set the annunciator's address and baud rate in accordance with Table 2. Switches **SW2-1** (LSB) through **SW2-7** (MSB) set the annunciator's address, and switch **SW2-8** sets the annunciator's baud rate.

SW2-8 OFF or OPEN = 1200 Baud (used to take the unit off line).

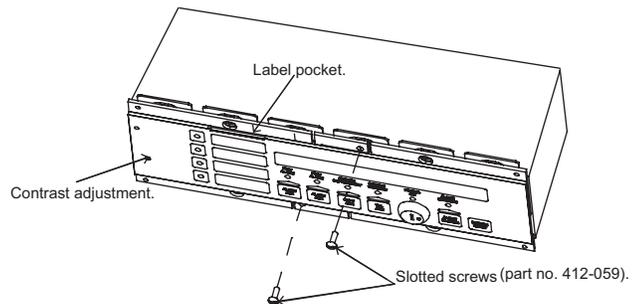
SW2-8 ON or CLOSED = 9600 Baud.



**Figure 4. DIP Switch SW2**

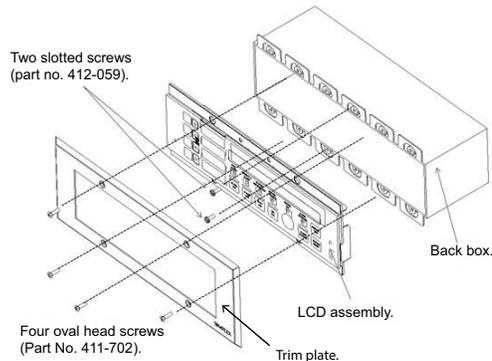
- Using the two slotted screws provided, mount the annunciator in the back box, see Figure 5.

**Note:** When installing the LCD assembly, it is important to use the holes specified in Figure 5.



**Figure 5. LCD assembly**

- Label the user-defined labels with the appropriate designation. Pull the top of the label pocket forward and insert the user-defined labels.
- Using the four oval-head screws provided, mount the trim plate to the back box, see Figure 6.



**Figure 6. Expanded view of 4603-9101 LCD Annunciator**

**Note:**

- The trim plate covers a hole in the keyboard which provides access to the display's viewing angle potentiometer.

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## Address chart

Table 2: Address chart

SW2-1 (LSB)	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7 (MSB)		ADDRESS
OFF	ON	ON	ON	ON	ON	ON	=	ADDRESS 1
ON	OFF	ON	ON	ON	ON	ON	=	ADDRESS 2
OFF	OFF	ON	ON	ON	ON	ON	=	ADDRESS 3
ON	ON	OFF	ON	ON	ON	ON	=	ADDRESS 4
OFF	ON	OFF	ON	ON	ON	ON	=	ADDRESS 5
ON	OFF	OFF	ON	ON	ON	ON	=	ADDRESS 6
OFF	OFF	OFF	ON	ON	ON	ON	=	ADDRESS 7
ON	ON	ON	OFF	ON	ON	ON	=	ADDRESS 8
OFF	ON	ON	OFF	ON	ON	ON	=	ADDRESS 9
ON	OFF	ON	OFF	ON	ON	ON	=	ADDRESS 10
OFF	OFF	ON	OFF	ON	ON	ON	=	ADDRESS 11
ON	ON	OFF	OFF	ON	ON	ON	=	ADDRESS 12
OFF	ON	OFF	OFF	ON	ON	ON	=	ADDRESS 13
ON	OFF	OFF	OFF	ON	ON	ON	=	ADDRESS 14
OFF	OFF	OFF	OFF	ON	ON	ON	=	ADDRESS 15
ON	ON	ON	ON	OFF	ON	ON	=	ADDRESS 16
OFF	ON	ON	ON	OFF	ON	ON	=	ADDRESS 17
ON	OFF	ON	ON	OFF	ON	ON	=	ADDRESS 18
OFF	OFF	ON	ON	OFF	ON	ON	=	ADDRESS 19
ON	ON	OFF	ON	OFF	ON	ON	=	ADDRESS 20
OFF	ON	OFF	ON	OFF	ON	ON	=	ADDRESS 21
ON	OFF	OFF	ON	OFF	ON	ON	=	ADDRESS 22
OFF	OFF	OFF	ON	OFF	ON	ON	=	ADDRESS 23
ON	ON	ON	OFF	OFF	ON	ON	=	ADDRESS 24
OFF	ON	ON	OFF	OFF	ON	ON	=	ADDRESS 25
ON	OFF	ON	OFF	OFF	ON	ON	=	ADDRESS 26
OFF	OFF	ON	OFF	OFF	ON	ON	=	ADDRESS 27
ON	ON	OFF	OFF	OFF	ON	ON	=	ADDRESS 28
OFF	ON	OFF	OFF	OFF	ON	ON	=	ADDRESS 29
ON	OFF	OFF	OFF	OFF	ON	ON	=	ADDRESS 30
OFF	OFF	OFF	OFF	OFF	ON	ON	=	ADDRESS 31
ON	ON	ON	ON	ON	OFF	ON	=	ADDRESS 32
OFF	ON	ON	ON	ON	OFF	ON	=	ADDRESS 33
ON	OFF	ON	ON	ON	OFF	ON	=	ADDRESS 34
OFF	OFF	ON	ON	ON	OFF	ON	=	ADDRESS 35
ON	ON	OFF	ON	ON	OFF	ON	=	ADDRESS 36
OFF	ON	OFF	ON	ON	OFF	ON	=	ADDRESS 37
ON	OFF	OFF	ON	ON	OFF	ON	=	ADDRESS 38
OFF	OFF	OFF	ON	ON	OFF	ON	=	ADDRESS 39
ON	ON	ON	OFF	ON	OFF	ON	=	ADDRESS 40
OFF	ON	ON	OFF	ON	OFF	ON	=	ADDRESS 41
ON	OFF	ON	OFF	ON	OFF	ON	=	ADDRESS 42
OFF	OFF	ON	OFF	ON	OFF	ON	=	ADDRESS 43
ON	ON	OFF	OFF	ON	OFF	ON	=	ADDRESS 44
OFF	ON	OFF	OFF	ON	OFF	ON	=	ADDRESS 45
ON	OFF	OFF	OFF	ON	OFF	ON	=	ADDRESS 46
OFF	OFF	OFF	OFF	ON	OFF	ON	=	ADDRESS 47
ON	ON	ON	ON	OFF	OFF	ON	=	ADDRESS 48
OFF	ON	ON	ON	OFF	OFF	ON	=	ADDRESS 49
ON	OFF	ON	ON	OFF	OFF	ON	=	ADDRESS 50
OFF	OFF	ON	ON	OFF	OFF	ON	=	ADDRESS 51
ON	ON	OFF	ON	OFF	OFF	ON	=	ADDRESS 52
OFF	ON	OFF	ON	OFF	OFF	ON	=	ADDRESS 53
ON	OFF	OFF	ON	OFF	OFF	ON	=	ADDRESS 54
OFF	OFF	OFF	ON	OFF	OFF	ON	=	ADDRESS 55
ON	ON	ON	OFF	OFF	OFF	ON	=	ADDRESS 56
OFF	ON	ON	OFF	OFF	OFF	ON	=	ADDRESS 57
ON	OFF	ON	OFF	OFF	OFF	ON	=	ADDRESS 58
OFF	OFF	ON	OFF	OFF	OFF	ON	=	ADDRESS 59
ON	ON	OFF	OFF	OFF	OFF	ON	=	ADDRESS 60
OFF	ON	OFF	OFF	OFF	OFF	ON	=	ADDRESS 61
ON	OFF	OFF	OFF	OFF	OFF	ON	=	ADDRESS 62
OFF	OFF	OFF	OFF	OFF	OFF	ON	=	ADDRESS 63
ON	ON	ON	ON	ON	ON	OFF	=	ADDRESS 64

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Table 2: Address chart (Continued)

SW2-1 (LSB)	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7 (MSB)		ADDRESS
OFF	ON	ON	ON	ON	ON	OFF	=	ADDRESS 65
ON	OFF	ON	ON	ON	ON	OFF	=	ADDRESS 66
OFF	OFF	ON	ON	ON	ON	OFF	=	ADDRESS 67
ON	ON	OFF	ON	ON	ON	OFF	=	ADDRESS 68
OFF	ON	OFF	ON	ON	ON	OFF	=	ADDRESS 69
ON	OFF	OFF	ON	ON	ON	OFF	=	ADDRESS 70
OFF	OFF	OFF	ON	ON	ON	OFF	=	ADDRESS 71
ON	ON	ON	OFF	ON	ON	OFF	=	ADDRESS 72
OFF	ON	ON	OFF	ON	ON	OFF	=	ADDRESS 73
ON	OFF	ON	OFF	ON	ON	OFF	=	ADDRESS 74
OFF	OFF	ON	OFF	ON	ON	OFF	=	ADDRESS 75
ON	ON	OFF	OFF	ON	ON	OFF	=	ADDRESS 76
OFF	ON	OFF	OFF	ON	ON	OFF	=	ADDRESS 77
ON	OFF	OFF	OFF	ON	ON	OFF	=	ADDRESS 78
OFF	OFF	OFF	OFF	ON	ON	OFF	=	ADDRESS 79
ON	ON	ON	ON	OFF	ON	OFF	=	ADDRESS 80
OFF	ON	ON	ON	OFF	ON	OFF	=	ADDRESS 81
ON	OFF	ON	ON	OFF	ON	OFF	=	ADDRESS 82
OFF	OFF	ON	ON	OFF	ON	OFF	=	ADDRESS 83
ON	ON	OFF	ON	OFF	ON	OFF	=	ADDRESS 84
OFF	ON	OFF	ON	OFF	ON	OFF	=	ADDRESS 85
ON	OFF	OFF	ON	OFF	ON	OFF	=	ADDRESS 86
OFF	OFF	OFF	ON	OFF	ON	OFF	=	ADDRESS 87
ON	ON	ON	OFF	OFF	ON	OFF	=	ADDRESS 88
OFF	ON	ON	OFF	OFF	ON	OFF	=	ADDRESS 89
ON	OFF	ON	OFF	OFF	ON	OFF	=	ADDRESS 90
OFF	OFF	ON	OFF	OFF	ON	OFF	=	ADDRESS 91
ON	ON	OFF	OFF	OFF	ON	OFF	=	ADDRESS 92
OFF	ON	OFF	OFF	OFF	ON	OFF	=	ADDRESS 93
ON	OFF	OFF	OFF	OFF	ON	OFF	=	ADDRESS 94
OFF	OFF	OFF	OFF	OFF	ON	OFF	=	ADDRESS 95
ON	ON	ON	ON	ON	OFF	OFF	=	ADDRESS 96
OFF	ON	ON	ON	ON	OFF	OFF	=	ADDRESS 97
ON	OFF	ON	ON	ON	OFF	OFF	=	ADDRESS 98
OFF	OFF	ON	ON	ON	OFF	OFF	=	ADDRESS 99
ON	ON	OFF	ON	ON	OFF	OFF	=	ADDRESS 100
OFF	ON	OFF	ON	ON	OFF	OFF	=	ADDRESS 101
ON	OFF	OFF	ON	ON	OFF	OFF	=	ADDRESS 102
OFF	OFF	OFF	ON	ON	OFF	OFF	=	ADDRESS 103
ON	ON	ON	OFF	ON	OFF	OFF	=	ADDRESS 104
OFF	ON	ON	OFF	ON	OFF	OFF	=	ADDRESS 105
ON	OFF	ON	OFF	ON	OFF	OFF	=	ADDRESS 106
OFF	OFF	ON	OFF	ON	OFF	OFF	=	ADDRESS 107
ON	ON	OFF	OFF	ON	OFF	OFF	=	ADDRESS 108
OFF	ON	OFF	OFF	ON	OFF	OFF	=	ADDRESS 109
ON	OFF	OFF	OFF	ON	OFF	OFF	=	ADDRESS 110
OFF	OFF	OFF	OFF	ON	OFF	OFF	=	ADDRESS 111
ON	ON	ON	ON	OFF	OFF	OFF	=	ADDRESS 112
OFF	ON	ON	ON	OFF	OFF	OFF	=	ADDRESS 113
ON	OFF	ON	ON	OFF	OFF	OFF	=	ADDRESS 114
OFF	OFF	ON	ON	OFF	OFF	OFF	=	ADDRESS 115
ON	ON	OFF	ON	OFF	OFF	OFF	=	ADDRESS 116
OFF	ON	OFF	ON	OFF	OFF	OFF	=	ADDRESS 117
ON	OFF	OFF	ON	OFF	OFF	OFF	=	ADDRESS 118
OFF	OFF	OFF	ON	OFF	OFF	OFF	=	ADDRESS 119

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## General wiring precautions

- Use copper conductors for all wiring.
- Do not exceed the maximum lengths specified in Table 3 through Table 6.
- If shielding is used:
  - Ensure the metallic continuity of the shield is maintained throughout the entire length of cable.
  - Ensure the entire length of the cable has a resistance greater than  $1 \times 10^6$  ohms to Earth ground.
  - Ensure the shield connects to a SHIELD terminal at each annunciator and is terminated only at the main panel.
- Ensure underground wiring is free of water.
- Do not run wires through elevator shafts.
- Wire runs in plenums must be in a conduit unless they are rated for plenum use.
- Splicing is permitted in the following situations:
  - All connections are soldered (rosin-core solder), crimped in metal sleeves, or encapsulated with an epoxy resin.
  - When using solder or crimped metal sleeves, ensure the junction is insulated using a high-grade electrical tape that equals the quality of the original insulating jacket.
  - The shield's continuity is maintained throughout the cable's length.
- Do not run other wiring in the same conduit as system wiring.

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## Specific wiring precautions

- Ensure that 24V power wiring is power limited.
- 4603-9101 LCD Annunciator wiring that leaves the building, either above or below ground, requires overvoltage suppression at both ends.
- Communication and power wiring **must** use a UL497B listed suppressor that is compatible with a maximum circuit voltage of at least 32VDC, and a current rating high enough for the circuit.
- The maximum wire length is 2500 feet (762 meters).
- Use the Simplex suppressor, model number 2081-9027 (200 mA maximum) or 2081-9028 (5-amp maximum) isolated loop circuit protector.
  - For underground wiring, select the appropriate isolated loop circuit protector. Run the circuit wiring in a separate parallel wiring trough, to separate it from any commercial power distribution wiring.
  - For overhead wiring, select the appropriate isolated loop circuit protector. The wiring is limited to one contiguous property and the total wire length **must** not exceed 2500 feet (762 meters). Run the circuit wiring on separate poles, to separate it from any poles supporting commercial power distribution wiring. Run the circuit wiring in parallel with direct relation to the commercial power distribution. The separation is a minimum distance (whichever is greater) of 100 feet (30.48 meters), or the maximum span between any two adjacent poles of either the system's circuit or the commercial power distribution circuit.
- For more information about maximum wire lengths when using circuit protectors, see Tables 3 through 6.
- Communication wiring is supervised and power limited.
- For more information about wiring the 4603-9101 LCD Annunciator, refer to the following manuals:
  - *4100 Field Wiring Diagram*, 841-731.
  - *4100ES Fire Alarm System Installation Guide*, 574-848.
  - *4100+ Fire Alarm System Contractor Installation Instructions*, 574-019.
  - *4020 Fire Alarm System Contractor Installation Instructions*, 574-061.

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## 4100ES/4100U/ 4100+/4020 to LCD Annunciator wiring for serial communication

When wiring a 4100ES/4100U/4100+/4020 FACU to an LCD Annunciator for serial communication:

- The annunciator terminal blocks accommodate 12-18 AWG wire.
- When used with audio riser wiring, telephone wiring, or 4120 Network wiring, the communication lines **must** be twisted-shielded pair.
- Parallel configurations are acceptable where the total distance of all series and parallel runs do not exceed the maximum distances specified in Table 5 and Table 6.
- The maximum operating conditions for the Communication Line is 32VDC, 130mA.

## 4100ES/4100U/ 4100+/4020 to LCD Annunciator wiring for operating power

When wiring a 4100ES/4100U/4100+/4020 FACU to an LCD Annunciator for operating power:

- The annunciator terminal blocks accommodate 12-18 AWG wire, see Table 3 and Table 4.
- Each 4603-9101 LCD Annunciator uses:
  - 110 mA (0.110 A) in standby.
  - An alarm current of 140 mA.
  - A battery standby current (backlight and piezo off) is 65 mA.
- Ensure the operating power is provided by the system power supply.
- The supply voltage is 24V nominal.

## Wire length tables

Table 3 and Table 4 show the maximum wire lengths possible when power wire, two wires, are used and Table 5 and Table 6 show the maximum wire lengths when communication line, a twisted-shielded pair of wires, is used.

### Note:

- When using multiple annunciators and runs, ensure that the total of all runs does not exceed 10,000 feet (3048 meters) (including T-Taps).
- The maximum number of 2081-9044 over-voltage protectors on a single communication loop is four. The maximum number of 2081-9028 isolated loop circuit protectors on a single communication loop is four.
- To convert feet to meters, multiply the number of feet by 0.3048.

### Power wire tables

**Table 3: With 2081-9044 Overvoltage Protectors**

Total Current (Amps)	12 AWG (3.309 mm <sup>2</sup> )	14 AWG (2.801 mm <sup>2</sup> )	16 AWG (1.309 mm <sup>2</sup> )	18 AWG (0.823 mm <sup>2</sup> )
0.100	2,500ft (762m)	2,500ft (762m)	2,371ft (722.68m)	1,409ft (429.46m)
0.200	2,500ft (762m)	1,782ft (543.15m)	889ft (270.96m)	705ft (214.88m)

*Continued on the next page.*

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## Wire length tables

**Table 4: Without Transient Suppression (or 2081-9028 Isolated Loop Circuit Protectors)**

Total Current (Amps)	12 AWG (3.309 mm <sup>2</sup> )	14 AWG (2.801 mm <sup>2</sup> )	16 AWG (1.309 mm <sup>2</sup> )	18 AWG (0.823 mm <sup>2</sup> )
0.100	2,500ft (762m)	2,500ft (762m)	2,500ft (762m)	2,349ft (715.97m)
0.200	2,500ft (762m)	2,500ft (762m)	1,482ft (451.71m)	1,175ft (358.14m)
0.300	2,500ft (762m)	1,980ft (603.5m)	988ft (301.14m)	783ft (238.65m)
0.400	2,361ft (719.63m)	1,485ft (452.62m)	741ft (225.85m)	587ft (178.91m)
0.500	1,889ft (575.76m)	1,188ft (362.1m)	593ft (180.74m)	470ft (143.25m)
0.600	1,574ft (479.75m)	990ft (301.75m)	494ft (150.57m)	392ft (119.48m)
0.700	1,349ft (411.17m)	849ft (258.77m)	423ft (128.93m)	336ft (102.41m)
0.800	1,181ft (359.96m)	743ft (226.46m)	371ft (113.08m)	294ft (89.61m)
0.900	1,049ft (319.73m)	660ft (201.16m)	329ft (100.27m)	261ft (79.55m)
1.000	944ft (287.73m)	594ft (181.05m)	296ft (90.22m)	235ft (71.62m)
1.100	859ft (261.82m)	540ft (164.59m)	269ft (81.99m)	214ft (65.22m)
1.200	787ft (239.87m)	495ft (150.87m)	247ft (75.28m)	196ft (59.74m)
<b>With 2081-9027 isolated Loop Circuit Protectors</b>				
0.100	2,500ft (762m)	2,500ft (762m)	2,371ft (722.68m)	1,409ft (429.46m)
0.200	2,500ft (762m)	1,782ft (543.15m)	889ft (270.96m)	705ft (214.88m)

## Communication line tables

**Table 5: With 2081-9044 Overvoltage Protectors**

12 AWG (3.309 mm <sup>2</sup> )	14 AWG (2.801 mm <sup>2</sup> )	16 AWG (1.309 mm <sup>2</sup> )	18 AWG (0.823 mm <sup>2</sup> )
2,500ft (762m)	2,500ft (762m)	2,450ft (746.76m)	1,650ft (502.92m)

**Table 6: Without Transient Suppression (or 2081-9028 Isolated Loop Circuit Protectors)**

12 AWG (3.309 mm <sup>2</sup> )	14 AWG (2.801 mm <sup>2</sup> )	16 AWG (1.309 mm <sup>2</sup> )	18 AWG (0.823 mm <sup>2</sup> )
2,500ft (762m)	2,500ft (762m)	2,500ft (762m)	2,500ft (762m)
<b>With 2081-9027 isolated Loop Circuit Protectors</b>			
2,500ft (762m)	2,500ft (762m)	2,450ft (746.76m)	1,650ft (502.92m)

## Checkout procedure

When the installation is complete, verify that the remote annunciator is working correctly:

1. Verify that the LEDs and the LCD are working by turning the keyswitch OFF and then ON. This process causes the remote annunciator to execute a self-test which checks each LED and the LCD.
2. Verify that the annunciator communicates properly with the FACU by observing the remote annunciator. If the annunciator is not wired properly and is not communicating with the FACU, error messages are displayed and an audible signal is emitted. Also, a card missing trouble is displayed at the FACU.

**Note:** For Programming changes, refer to the relevant panel programming manual.